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Practical Pharmacy Edition

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TAKING OURSELVES SERIOUSLY

THE Mercer County Pharmaceutical Association in New Jersey has sent us an interesting resolution. Its members object to some manufacturers using the name of pharmacists as a class to bolster their claims before the public. Aside from the merits of this question, we like the flavor of the resolution. It shows independent thinking by a group of men who take the dignity of their profession seriously.

This is reflected in the resolution. It says "any commercial company that speaks in the name of, or dedicates any form of advertising to, the druggists of America is, by inference at least, identifying the druggists with the contents of the advertising, as well as with the business tactics and practices of the advertising company."

In another "whereas" supporting their objection, Mercer County pharmacists had this to say: "Allowing such inferences to be presented to the public without prior consultation with accredited representatives of the pharmacy profession . . . tends to subject pharmacists to a representation over which they have had no control; and such representation might prove misleading or injurious to the welfare of the public."

Here is professional pride and respect for ethical character in the practice of pharmacy. This kind of thinking always marks a true profession. Certainly Mercer County has no monopoly on it. We do think that too many pharmacists are in the habit of glooming about conditions over which they think they have no control. The pharmacist has a right to his say on practices in or involving his profession. He has democratic organizations at the county, state and national levels to translate his needs into practical programs of action for a better profession of pharmacy.

This depends largely on the individual pharmacist being willing to admit his importance and responsibility in medical care, and on his willingness to support organizations that provide collective strength to help eliminate anything that may harm the status of pharmacy.

In short this means collective professional pride. We could do with more of it.

A MILESTONE

IT WOULD be difficult to overemphasize the importance of the Pharmaceutical Survey. Every community pharmacist should recognize that this can be the most important professional milestone in his lifetime. The Survey will have importance to the extent that popular support breathes into the data a life and spirit needed to bring about necessary reforms.

Chances are there will be evidence calling for changes in many of our ways of thinking and doing. This is never easy. If we expect miracles without bother, the Survey—however valid and meaningful—just will not translate into anything of practical value. We shall have to reexamine honestly personal pet theories and provincial pride in things as they are. As usual in pharmacy, analysis will be simpler than the synthesis of something better.

A natural question will arise: Are the Survey conclusions valid? No one can yet answer this question. We do know that the Survey is soundly backed by the American Foundation for Pharmaceutical Education, through a grant of $100,000, and probably another $75,000 to bring some unfinished projects to completion. It is sponsored by the American Association of Colleges of Pharmacy. It is conducted by the American Council on Education. Its director, Dr. E. C. Elliott, is a man of ability and forthrightness, with a knack for going to the heart of a problem. He has no axe to grind; and no one who knows him could believe that he will permit his findings to be colored by pressures from special-interest groups of the profession.

Dr. Elliott and his staff are now assembling, sorting, and sifting a mass of raw Survey material. An additional year (until June 30, 1948) will probably be needed to process and implement the data gathered—and, if additional funds are made available, to complete certain studies that have been undertaken.

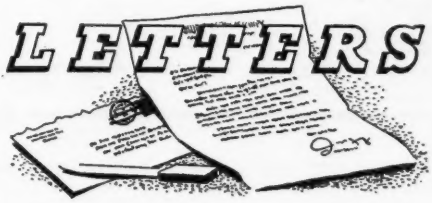
Dr. Elliott has confessed his lack of interest in pharmacy as "an ancient and honorable profession." This refreshing viewpoint reflects his determination to plumb the depths of modern pharmacy and to locate the stumbling blocks to further professional progress.

If this objective study fulfills its promise and is translated into action, it will be of vital importance to all of us. After the Survey proper has been completed some way should be found to set up certain Survey projects—such as student predictive and achievement tests and the prescription practice analysis—as a continuing study.

WANTS RECIPROCITY RULES CHANGED

Sirs:

For several years I have been reading the *Practical Pharmacy Edition* of the JOURNAL and have derived a great deal of pleasure from your professional comments. I want to comment on a matter that I have not seen discussed.



There is a crying need to modify the present reciprocity requirements, similar to that of the medical profession, without destroying the high standards of pharmacy. For example, candidates for reciprocity, who do not meet the requirements of the state in which they wish to practice, should be given consideration under a fair and sensible rule that should be added to the present National Association of Boards of Pharmacy regulations on reciprocity, such as the following:

"Any candidate not meeting the reciprocity regulations of a state may substitute years of practice as a registered pharmacist, at least ten years' experience in good standing as a licensed pharmacist in a state or territory of the United States, and providing that the secretary of the state pharmaceutical association will certify that the candidate is a dues-paid member in good standing;"

or

"Any candidate not meeting the reciprocity regulations of a state, having at least five years of full-time hospital pharmacy experience in good standing as a licensed pharmacist in a state or territory of the United States, and providing that the secretary of the American Society of Hospital Pharmacists will certify that the candidate is a dues-paid member in good standing."

Recent shortages of pharmacists in retail and hospital work throughout the country in my opinion makes an immediate revision of the reciprocity regulations necessary. In this manner a great number of capable and competent pharmacists would be able to reciprocate and fill in the local shortages, thereby distributing skilled people over a larger geographic area. This would not be a detriment to organized pharmacy.

Boston Harbor, Mass. ROBERT I. LIBERFARB

SAWING OFF THE LIMB?

Sirs:

This seems to be a day of usurpers in the field of pharmacy (such as some of the large chains and the super-marts) whose only interest in pharmacy is as a source of revenue. It is high time to speak of the saboteurs who make it possible for these people to succeed. I have in mind those pharmacists, the independent employers, who are sawing off the limb upon which they sit. . . . They must offer benefits to employed pharmacists that will keep them out of the camp of the outsiders. They will also have to offer the public benefits and service that will keep the practice of pharmacy where it belongs. . .

Milwaukee, Wis. A. A. S.

RETURNING TO CHINA

Sirs:

For the information of our friends whom we met personally, and those whom we met through correspondence, as well as all who may care to write to us while we are in China, may I say that according to present plans Mrs. Meuser and I expect to sail from San Francisco for China in the near future. Our address as before will be: West China Union University, Department of Pharmacy, Chengtu, Szechwan, China.

I wish to take this opportunity of thanking one and all who have helped to make this furlough period pleasant for us, and who have contributed in inspiration and encouragement and in any material way toward our task of developing modern pharmaceutical education and practice in China on a Christian, ethical basis.

With best regards to you and to all readers of the JOURNAL OF THE A. PH. A.

Toronto, Canada E. A. MEUSER

COMMENTS FROM MEMBERS

Sirs:

I've returned from overseas at last, and have been home since 24 December. . . . Your letter accompanying the bill for dues, telling of the progress and accomplishments of the A. PH. A. during the past year, was very interesting and most welcome! Looking at it from the personal view of the homecoming veterans, our chances for good jobs are markedly increased by this past year's doings of the A. PH. A.

Boston, Mass. A. J. VAZAHAS

Sirs:

Thank you for forwarding so promptly the copy of the JOURNAL OF THE A. PH. A. It is most practical and maintains a high standard of readability. I am enclosing membership dues in the American Society of Hospital Pharmacists which promises to be a great help to our cause. If I can be of any assistance in aiding the work of the ASSOCIATION and the Society I shall be happy to do so.

Los Angeles, Calif. VESTA S. BURNS

Sirs:

The enclosed check pays for my 1947 dues and the *Practical Pharmacy Edition* of the JOURNAL. I enjoyed every copy.

San Francisco, Calif. E. C. SHALER

STRAIGHT FROM HEADQUARTERS

by ROBERT P. FISCHELIS, Secretary
AMERICAN PHARMACEUTICAL ASSOCIATION

HEALTH PROFESSIONS CANNOT EVADE RESPONSIBILITY

AS OUR materia medica changes from the use of a variety of drugs combined for symptomatic treatment to the use of materials having specific therapeutic action, it becomes highly essential for physicians and pharmacists to be fully acquainted with the dangers as well as the salutary effects of such drugs. Recent clinical experiences have brought out once more the possibility of danger inherent in the use of very valuable but highly potent drugs. Physicians and pharmacists are relied upon by patients to exercise the same care in the preparation and administration of drugs as is exercised in the operating room. When a patient employs a physician for diagnosis and treatment of his ailments he expects that physician to see the case through and to give all of the individual attention to the case that it merits.

If it becomes necessary to use a dangerous drug the physician must be explicit in his directions as to how this drug is to be used. If the pharmacist has any reason to believe that the physician does not possess full knowledge of the dangerous phases of employing a certain drug it is his business to assure himself that the physician is fully informed. This is the modern service that the apothecary should supply to the physician, and through him to the patient, in connection with many new drugs now emanating from the manufacturing laboratories. The compounding function of the pharmacist has become secondary to this educational function. The more complicated our system of branding of drugs becomes and the more prolific the development of new drugs, the greater the reliance of the physician on the pharmacist who can be depended upon for essential information.

For the physician or the pharmacist to attempt to pass the responsibility for properly protecting the patient against untoward effects of new drugs to someone else, and particularly to the patient, is to evade the professional reliance that the patient properly places in both.

We believe the suggestion that patients be warned against dangers of drugs supplied to them on prescriptions by some kind of warning notice on the prescription label is an attempted evasion of a responsibility that neither the physician nor the pharmacist has any right to shirk. When the patient places his life in the hands of the doctor or the pharmacist and pays them for their services he is entitled to their undivided attention with respect to his safety. It is no credit to either profession for its members to attempt to pass the buck in a matter of this kind to the patient himself.

NO SUBSTITUTE FOR CARE AND ACCURACY

PERSONS who deal with matters pertaining to the life and health of people must never be careless. The engineer of a fast train, the pilot of an airplane, the surgeon and the pharmacist are among those who constantly deal with matters of life and death. Errors of judgment, failure to observe safety rules, and lack of attention to details may cause tragic results in the work of these specialists.

Daily contact with and continuous performance of such duties is apt to breed careless disregard of the dangers which beset these activities. This must not be allowed to occur, and happily it does not occur very often.

The metropolitan press in and around New York and New England recently carried stories of the failure of some pharmacists to meet exacting requirements in prescription compounding. Regardless of the merits of the procedure by which such alleged careless compounding was discov-

ered, it behooves pharmacists to take heed that there shall be no lack of vigilance and no lack of accuracy in the primary function that pharmacists are called upon to discharge as their contribution to the care of the sick.

It is reported that a state board of pharmacy had to suspend the registration of a number of pharmacists said to have been careless in their compounding. It is hoped that the warning this news carries will be sufficient to remind pharmacists everywhere that the slightest deviation from the care and accuracy expected in the compounding of prescriptions may be responsible for the loss of human lives.

WHAT CONSTITUTES "PRACTICAL EXPERIENCE"?

WHAT constitutes "practical experience" continues to agitate hospital pharmacists and others interested in a legal definition for this term. There is still considerable evidence that "practical experience" is an essential part of the educational process for turning out good pharmacists. There is also considerable controversy as to whether this practical experience should be made comparable to the internship served by medical students and by those in engineering, architecture, and other professional callings, or whether practical experience should be something that is gained during vacations between college terms. This is all a matter of supervision, and it would be well to have unbiased reports on the various plans now in vogue in the states claiming to exercise some type of supervision over this activity.

As far as hospital pharmacists are concerned, the issue is being clouded somewhat because of an apparent feeling that there is discrimination against crediting hospital pharmacy training to meet the experience requirement.

Those hospital pharmacists who contend that full credit should be given for hospital pharmacy alone in meeting the practical experience requirement base their argument on a high conception of hospital pharmacy practice. They speak of rotating internships in hospital pharmacies, of pharmaceutical manufacturing in hospital pharmacies, of compounding large numbers of prescriptions in hospital pharmacies and of contacting the public in the out-patient department. What they overlook is that there are comparatively few such hospital pharmacies. It would be a great public service if all hospital pharmacies were conducted under the supervision of the kind of competent hospital pharmacists who constitute the officers and active members of the American Society of Hospital Pharmacists. These men and women have gone far in creating a standard of excellence in hospital pharmacy administration that makes the output of interns from such establishments a very valuable addition indeed to the available licensed pharmacists.

However, there are hospitals in every large city and in many small communities where the supervision of a qualified hospital pharmacist is either lacking entirely or confined to a few hours a day. Obviously such places are no more qualified to train personnel for the broader activities required of competent hospital pharmacists than some of our mediocre retail drugstores are qualified to offer training in prescription practice.

It is of very little credit to the state boards of pharmacy that establishments which have few or no qualifications for training pharmacists are permitted to certify to the alleged "practical experience" of applicants for registration.

This is a phase of the regulation of the practice of pharmacy in which boards of pharmacy should exercise their administrative function with keen discrimination so that both the public and the pharmaceutical recruit are given a square deal.

In solving this problem it must be realized that neither every drugstore nor every hospital pharmacy is a proper place for an applicant to obtain practical experience. The boards of pharmacy must exercise the discrimination with which they have been legally endowed in order to carry out the spirit as well as the letter of the law on this subject. This can be done only by laying down certain minimum requirements and defining the term "practical experience" in a way to assure proper teaching of the intern by a capable and sympathetic preceptor.

It is a forward step to find the National Association of Boards of Pharmacy finally giving attention to this important phase of pharmaceutical licensure. One can be assured that the right solution will be found when members of boards of pharmacy and members of college faculties discuss this subject as has been the case this year in the various district meetings. We look forward to a sound, fair, and completely satisfactory solution to this problem in the not distant future.

FOR TOPICAL VEHICLES . . .
THE POLYETHYLENE GLYCOLS

by GLORIA NIEMEYER

UNCTUOUS, WATER SOLUBLE AND NON-VOLATILE, THE "CARBOWAX" COMPOUNDS OFFER FLEXIBILITY IN EXTEMPORANEOUS FORMULAS

RECENT use of both the liquid polyethylene glycols and the "Carbowax" solid compounds fills a need for an unctuous, yet water-soluble, nonvolatile compound possessing a combination of these properties. In pharmaceutical practice the Carbowax compounds have been found useful as bases for lotions, as ointment vehicles for medicaments and as vehicles for ephedrine and benzedrine in nasal preparations, for benzocaine, and for hormones.

Some of the patents relating to the use of these compounds in medicine cover their application as a vehicle for morpholine periodide, as a tampon lubricant, as a base for shaped medicinal articles such as suppositories, and as a lubricant for the skin.

These compounds have also found diverse applications in many industries where they are used as binders, spreaders, coupling agents, dispersants, plasticizers, humectants, solvents, intermediates, sizing materials and special lubricants.

Polyethylene glycols have the general formula, $HOCH_2(CH_2OCH_2)_xCH_2OH$. Those with average molecular weights ranging from 200 to 700 are liquids; those above 1000 in molecular weight are wax-like solids that are sold under the registered trademark "Carbowax."* Of particular interest to pharmacists are the higher polyethylene glycols, also known as polyoxyethylene glycols.

Previous to the development of these higher polyethylene glycols, a compound having a combination of both unctuous and water-soluble properties was not available. Consequently, attempts to make water-soluble, unctuous compositions were concerned principally with the use of emulsions and suspensions of oil in water which, in many cases, were not altogether satisfactory.

With the development of these compounds it is now possible to control the consistency of a mixture in which they are used. Also, by blending members of the series, the molecular weight can be altered and mixtures having intermediate properties are thus produced.

This possibility opens an avenue to the preparation of many new ointment bases that may be of great usefulness in pharmacy. Carbowax compound 1500 is an example of such a blend, which is being used extensively in pharmaceutical preparations. Its hygroscopicity is intermediate between that of the liquid and solid polymers, while its viscosity and solvent characteristics approach that of the liquid polyglycols. These properties, combined with a melting point equivalent to body temperature make compound 1500 of particular interest. A still wider range in some properties is obtainable by blending these polymers with water, alcohols, or other glycols.

An example of an ointment in which a combination of the Carbowax compounds is used has been suggested by Keeney.[1]

Undecylenic acid	10 Gm.
Triethanolamine	6 Gm.
Propylene glycol	14 Gm.
Carbowax compound 1500	10 Gm.
Carbowax compound 4000	40 Gm.
Water, *q. s. ad.*	100 Gm.

Four liquid polyethylene glycols and five solid polyethylene glycols (Carbowaxes of varying molecular weights) are now commercially available. Each product represents a band of molecular weights, the average of which (except in the case of Carbowax compound 1500) is employed in characterizing the particular member of the series. The liquid compounds are thus known as polyethylene glycols 200, 300, 400, and 600, while the solids are known as Carbowax compounds 1000, 1500, 1540, 4000, and 6000. The properties of the various compounds vary with the molecular weight.

The higher polyethylene glycols have a wide variability in solvent action both for and in other chemicals. They are highly soluble in water moderately soluble in aromatic hydrocarbons and completely insoluble in aliphatic hydrocarbons.

*"Carbowax" compounds are available from Carbide and Carbon Chemicals Corp., 30 East 42nd St., New York, 17, N. Y.

This property makes them especially useful as dispersants and vehicles for dyes, medicaments, and essential oils. Higher polyethylene glycols do not hydrolyze or deteriorate, and they will not support mold growth.

Pharmacologically, these compounds apparently have no more irritating properties than either lanolin or petrolatum when in contact with the skin.[2]

Medical applications primarily pertain to the formulation of ointment vehicles. Recent trends are in the direction of use of the water-soluble polyethylene glycols, particularly Carbowax compound 1500. The harder polymers, Carbowax compounds 4000 and 6000, may be used as dusting vehicles for drugs such as the sulfonamides.

Of primary interest to practicing pharmacists is Carbowax compound 1500, which is particularly suited for use as a base or vehicle for drug or cosmetic preparations for topical application. It is being used as a water-soluble base for cosmetic creams, leg make-up, and suntan cream, and in hand lotions. It is said to give the creams superior softening, conditioning, and skin-smoothing properties without undesirable moist or "tacky" feeling on the skin. Its use is also suggested as a component of shaving cream, pomades and hairdressings.

In a recent study conducted for OSRD's Committee on Medical Research by Hopkins[3] many ointment bases were compounded and tested as to suitability in the treatment of dermatophytosis and allied conditions. Carbowax ointment bases were among the three types of bases tested. Each presented certain advantages. All of the bases tested contain ingredients that are relatively inert and rarely combine chemically with medicaments added to them. Each was used in over 500 cases without evidence of irritation or sensitization from their chemical action. Irritation attributed to their physical properties was occasionally observed when the ointment bases were applied to lesions for which the respective type of base was unsuited.

Carbowax ointment bases were found useful in dermatophytosis because they are good solvents for fatty acids and their soaps and because they can be used on fissured and denuded areas that are intolerant of most liquid preparations. These bases, according to Hopkins, do not have the macerating effect of fats or petrolatum and are convenient for application to the scalp because of the ease with which the ointment can be washed out. Carbowax ointments bring dissolved chemicals in contact with the skin in known dilution rather than as droplets dispersed in an emulsion. They spread evenly and adhere well even if the skin surface is moist.

The following formulas are representative of the carbowax ointment bases employed in the study.[3]

A.

Propylene glycol	35 cc.
Carbowax 1500	25 Gm.
Carbowax 4000	40 Gm.

B.

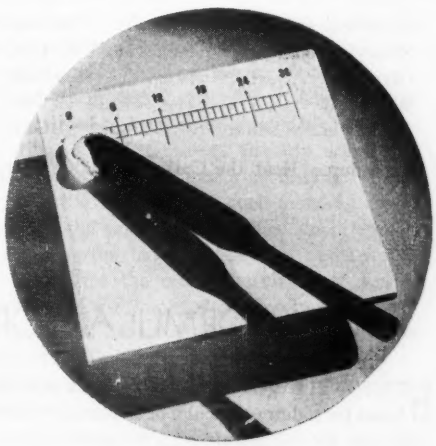
Water	25 cc.
Carbowax 1500	35 Gm.
Carbowax 4000	40 Gm.

C.

Propylene glycol	20 cc.
Carbowax 1500	40 Gm.
Carbowax 4000	20 Gm.
Zinc peroxide	20 Gm.

D.

Propylene glycol	10 cc.
Carbowax 1500	30 Gm.
Powdered starch	30 Gm.
Powdered zinc oxide	30 Gm.



Base A, which melts at 44 to 46° C., is suitable for any treatment agents soluble in propylene glycol. Water or alcohol markedly lower the melting point of these glycol mixtures. Carbowax 4000 in an equal part of water forms a fluid only slightly viscid at room temperature. Consequently if the active ingredients are added in aqueous or alcoholic solution, more Carbowax is required, as in formula B. If a paste is desired or an insoluble powder such as sulfur or zinc peroxide is the active ingredient, Carbowax 4000 can

be reduced or omitted, as in formulas C and D.

Carbowax 1500 may be used alone as a base, but it liquefies easily and leaves a somewhat sticky feeling when applied to the skin surface. These weaknesses are reduced by the addition of the harder carbowax 4000 and by mixture with talc or other insoluble powders. By mixing carbowax 1500 and 4000 with propylene glycol, ointments of any desired consistency may be prepared. Hopkins points out to physicians the flexibility of Carbowax compounds for prescribing topical medication to be prepared extemporaneously.

A formula for a highly compatible washable ointment base using Carbowax 4000, stenol and sodium lauryl sulfate has been suggested by Landon and Zopf.[4] In the experimental work a number of bases using these ingredients in different proportions were compounded. The following formula gave the most satisfactory results for a greaseless vehicle that is stable at elevated temperatures and will hold Whitfield's combination acceptably. This base was found to be nonirritating when applied to the unbroken skin. A number of official ointments were prepared using the proposed base with a resulting satisfactory preparation.

Carbowax compound 4000	20 Gm.
Stearyl alcohol	37 Gm.
Glycerin	30 Gm.
Water	12 Gm.
Sodium lauryl sulfate	1 Gm.

Procedure: Heat the Carbowax 4000, stearyl alcohol, and glycerin on a water bath to 65° C. Add in small quantities, with stirring, to the water which contains the sodium lauryl sulfate and has previously been heated to 65° C. Moderate stirring must continue until the base has congealed. Medicaments may be incorporated with ease by either the slab or mortar and pestle methods.

Another use of Carbowax compounds in the preparation of an alcoholic plastic jelly to be used as a vehicle for sulfathiazole has been outlined by Draeger and Pijoan.[5] Such a preparation has been successfully used in the treatment of impetigo contagiosa. The sulfathiazole jelly may be quickly applied, dries rapidly, is soluble in exudate and obviates the necessity for bandaging the lesions.

Methyl cellulose (15 cps.)	10 Gm.
Sulfathiazole	1 Gm.
Carbowax compound 1500	3 Gm.
Glycerol	1 Gm.
Water or 30% water and 70% alcohol	To make paste

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FORMULA FOR BENTONITE GEL

BENTONITE gels have been found suitable bases for sodium penicillin or any water soluble drug and for sulfonamides, fatty acids, salicylic acid and other treatment agents which may be dissolved in propylene glycol, alcohol or other suitable solvent before adding to the prepared base. Sulfur, ammoniated mercury, zinc oxide and other insoluble powders are readily incorporated in these bases.

Ointments with bentonite gel as a base, when spread very thinly on the face or hands, are invisible and leave the skin surface smooth as if recently powdered—not greasy or sticky. Addition of glycerin or propylene glycol slows drying out of the gel in a jar or on the skin. The following formula for a bentonite gel is representative

Bentonite	20 Gm.
Talc	10 Gm.
Water	55 cc.

Mix the bentonite with the talc and add slowly to the water with vigorous stirring. Soak overnight, rub smooth and add

Glycerin	5 cc.
Liquid petrolatum	5 cc.
White petrolatum	5 Gm.

Melt the petrolatum in the liquid petrolatum, before adding to the gel.

—*J. Invest. Dermat., 7: 171, 1946*

"I HAVE TO CARRY THAT"

by J. W. SNOWDEN*

HOW much does a professional man owe his community in supplying unrelated services? How much has the community a right to expect of him besides service related to supplying its drug, chemical, sickroom, hygiene and grooming needs?

For them to expect more, indicates a habit of thinking less of pharmacy as a profession than as just another retail business. True, certain items such as tobacco, fountain, photographic supplies and stationery have been so consistently associated with pharmacy in modern times, that if maintained in proper proportion they need not essentially obscure the professional character of the establishment's primary function.

The greatest hazard comes not so much from their use as from their abuse, which mostly originates with ambitious selling programs on the part of the manufacturers of supplies or equipment for those extraneous departments.

Take the business of magazines. No one can justly criticize the pharmacy that maintains a modest magazine department which displays, not too obstrusively, a professional man's selection of the standard magazines. Harm to the pharmacy desirous of representing itself as the community health service center begins when magazines, like a cancerous growth, begin spreading over the front of the establishment, obscuring the view from without and confusing the picture within. And such magazines! Certainly no one can maintain with honest conviction that any pharmacist has a compact to pander to morbid tastes or can deny that by doing so he lays his professional status open to being despised.

The pharmacy or drugstore is an establishment comprised of primary and incidental services. It is a pharmacy in fact, as well as name, only when the drug and health-allied departments dominate. Too many incidental departments consuming too much space affect the character of the store in the eyes of the public and depreciate it as a primary source of drug and health-allied products. Likewise, too complete a stock in an incidental department or a disproportionate amount of space given to it changes it from incidental to primary, with the same effect on the store as a whole. And the more superficial the tastes catered to by these incidental services, the more lightly is the caterer held, and thus the more blighting effect on him as a professional man.

A professional man is expected to have tastes superior to those of the average run-of-mill citizen. This he should strive to reflect in what he purchases for distribution to his community. Of all retailers *his* should be true selective buying—particularly selective in the incidental departments where, if they are to maintain the proportion of incidental, a narrow range is imperative.

The most enlightened concept of selling is that it is helping people *buy*—in other words, converting selling from high-pressure "push" methods to a rendering of a real service, making sales volume through making customers first. What other type of selling can be consistent with the concept of a profession which is itself the very epitome of service? The question then follows of how far the pharmacist can let it appear that he is going into incidental merchandising without destroying the thing that builds real customers for his basic departments: *He must maintain the impression that he renders as complete service in those departments as can be found anywhere.*

Even the professional man cannot be expected to run ahead of local standards in his selections but they should represent the top standards. Let lay merchants without a professional standing, and the selling power such standing represents for the professionally allied departments, scramble for the dregs. Perhaps as good a standard as any for the retail pharmacist to use in determining how far he should go in purchasing for incidental departments is to ask himself the question: "Does this merchandise allow me to stay in the *drug* business or does it put me in the '*dreg*' business?"

If a pharmacist is really sincere about carrying incidental lines chiefly to be of service to his community, the maintenance of professional character demands that those least accepted by tradition as consistent with pharmacy service should be carried in the back room. Then it will be apparent that he is carrying them as a service instead of a sales volume promotion. What he stands to lose in profit margins through smaller discounts on smaller purchases, he will gain back in the maintenance, free from confusion, of the selling forces so vital for his basic line of products and service, forces which are inherent in true professional character made readily apparent.

* Retail drug promotion specialist and builder of individually engineered drugstores, Rockville, Ind.

A REPORT ON
ANTIBIOTIC RESEARCH SYMPOSIUM

HIGHLIGHTS OF SESSION CALLED BY U. S. PUBLIC HEALTH SERVICE REFLECT EXPERIMENTAL TRENDS OF IMPORTANCE TO PHARMACIST

IS THERE an "enhancement factor" frequently present in amorphous penicillin that makes this impure form preferable to crystalline penicillin? Evidence supporting an affirmative answer to this question was presented at the National Symposium on Research in Antibiotics, held by the U. S. Public Health Service, in a paper by Dr. Henry Welch and co-workers at the Food and Drug Administration. They conclude that "it appears questionable whether amorphous penicillin should be gradually eliminated from the market."

Meanwhile, research workers in both independent and manufacturing laboratories have extended investigations to identify and elucidate the mode of action of the "enhancement factor." No reversal of the present trend away from amorphous penicillin to the crystalline form seems probable until various scientific and economic phases of the question have received full consideration.

FDA tests on random samples seemed to show that 40% to 60% of commercial lots of amorphous penicillin contain a substance of therapeutic importance that does not exist in crystalline penicillin. Evidence suggests that the process of manufacture may determine the presence or absence of the "factor" in commercial amorphous penicillin. When present it appears to enhance penicillin activity as much as 50% to 100%, although the factor itself is apparently devoid of activity in vivo.

Summarizing the present status of amorphous vs. crystalline penicillin, Dr. Welch said:

"During the past year, the basic manufacturers of penicillin have made strenuous efforts to place crystalline material on the market. With some manufacturers this has been to the exclusion of the amorphous material. In view of the data available, even though somewhat tenuous, it appears questionable whether amorphous penicillin should be gradually eliminated from the market.

"In the Food and Drug Administration laboratories we are in rather a fortunate position in that we have available to us the products of each of the basic manufacturers, and over the period of several years that we have been testing penicillin there has accumulated from stability and other investigational studies a number of vials of old lots of amorphous penicillin from various manufacturers. It occurred to us some time ago that an attempt should be made to determine whether it was possible, in the absence of in vitro methods, to demonstrate by some biological method the presence or absence of this 'ethereal' factor which appeared to exist in certain lots of commercial amorphous penicillin.

"The study being reported is concerned, then, with (*a*) the development of a method for demonstrating the presence of an enhancement factor in commercial penicillin, (*b*) the use of the method in screening various lots of penicillin of the fifteen basic manufacturers to determine the percentage of lots containing the 'factor,' and (*c*) miscellaneous studies dealing with stability, the effect of acid, penicillinase, heat, etc., on the 'factor.' "

In conclusion Welch and his co-workers made the following statements concerning the enhancement factor:

"1. A method is presented for detemining the presence of a 'factor' in penicillin which markedly enhances penicillin activity while being devoid of activity in vivo itself.

"2. The 'factor' is not inactivated by heating at 100° for 48 hours nor by penicillinase.

"3. The 'factor' enhances the effectiveness of each of the fractions G, F, X, K, and dihydro F proportionately to their basic in vivo activity.

"4. Examination of random samples of relatively old commercial lots of penicillin produced by the 15 basic manufacturers indicates that approximately 60% contain the 'factor.'

"5. Examination of a single lot of recent manufacture (amorphous penicillin) from 11 producers indicates that approximately 40% contain the 'factor.' "

Another important aspect of penicillin therapy —the use of caronamide to inhibit penicillin excretion—was presented at the Symposium by a group of researchers working in the Sharp and Dohme Laboratories where caronamide was synthesized. Administering penicillin with this new

chemical is believed to increase the effectiveness of penicillin as well as decrease the frequency of dose. Although these early experiments were carried out experimentally on dogs, the results are reportedly substantiated by clinical evidence not yet published.

It is well established that penicillin is excreted by way of the renal tubules in addition to glomerular filtration. Consequently, it is believed that suppression of penicillin excretion, by blocking the specific enzyme system responsible for penicillin transport through the tubular cells, would effect a considerably higher plasma concentration for a longer period of time than normally would be obtained following a given dose of penicillin.

Previously, both diodrast and para-aminohippuric acid (PAH) administered simultaneously with penicillin has been used to decrease the excretion of penicillin. Both of these substances, however, must be given in large amounts by continuous intravenous infusion.

By halting the tubular transport mechanism for penicillin excretion, caronamide was found to decrease the tubular excretion and increase the plasma concentration of penicillin G, K, F, and X. This effect is reversible and the function of the system returns to normal after administration of the compound is stopped. It is effective when administered orally or parenterally and when penicillin is administered by the same or a different route.

In another paper, "The Effect of Caronamide Upon Penicillin Therapy of Experimental Pneumococcus and Typhoid Infections in Mice," W. F. Verwey and A. Katherine Miller of the Sharp and Dohme Laboratories concluded:

"The oral administration of 4′-carboxyphenylmethanesulfonanilide (caronamide) was found to enhance considerably the therapeutic effectiveness of intramuscularly administered penicillin in mice experimentally infected with either Type I pneumococci or *E. typhosa*. This enhancement was 6- to 16-fold in the case of the pneumococcus experiments and approximately 4-fold for *E. typhosa*. These effects may be explained on the basis of the higher and more prolonged plasma penicillin concentrations when caronamide is administered, and do not indicate synergy between caronamide and penicillin."

Several reports on the relative activities of the various forms of penicillin were also given at the Symposium on Research in Antibiotics. Research workers from Chas. Pfizer and Co. indicate that attempts are being made to completely separate and identify all the eight forms of penicillin believed to be produced by the Q-176 culture which is used widely throughout the penicillin industry. To date, five penicillins—G, K,

AT THE SYMPOSIUM on Research in Antibiotics held in Washington, D. C., several investigators compare notes on clinicals trials of streptomycin in tuberculosis. Shown left to right are Dr. C. J. Van Slyke, U. S. Public Health Service, chief of the research grants division; Dr. Walsh McDermott, Cornell Medical College; Dr. Paul A. Bunn, Veterans Administration; and Dr. H. Corwin Hinshow, Mayo Clinic.

dihydo-F, F, and X—have been positively identified. Since there are indications of the identity of another penicillin with flavicin, and in the K fraction there seems to be one or possibly two additional penicillins, the authors concur in the belief that the culture now used may produce a mixture of eight penicillins.

Use of a crystalline sodium penicillin for penicillin in wax and oil was discussed by Dr. Monroe J. Romansky of George Washington School of Medicine. With the advent of crystalline penicillin it was desirable to compare preparations of this form in beeswax and oil with the amorphous calcium salt originally used in the Romansky formula. In a series of patients treated it was noted that they responded as well to the crystalline penicillin in oil and wax as to the amorphous preparation or to penicillin in aqueous solution.

24-Hour Penicillin Levels

Results of a study to determine the penicillin blood level after twenty-four hours using crystalline sodium and crystalline potassium penicillin in oil and wax showed that 90% of the 300 patients treated had an effective penicillin blood level of 0.039 unit per cc. or higher at the twenty-fourth hour after injection. Comparing this with previous studies in which amorphous calcium penicillin in oil and wax was used, it is noted that only 70–75% of the patients had levels for that period of time. Another possible factor favoring the use of crystalline penicillin in oil and wax preparations is that the incidence of allergic reactions seems to be somewhat less with the crystalline mixture than with the amorphous penicillin in oil and beeswax.

A comparison of blood levels obtained in dogs with oil and wax preparations of calcium penicillin and crystalline sodium and potassium penicillin G further substantiates evidence that crystalline penicillin is superior to the amorphous calcium penicillin for such use.

Comparing the penicillin blood levels using these different forms of the drug, Dr. J. C. Burke of the Squibb Laboratories offered the following conclusions:

"1. The oil-wax preparations of crystalline sodium penicillin G used in this study appeared to be superior to those made with crystalline potassium penicillin G for the 12- and 24-hour maintenance of plasma levels.

"2. The use of half the dose volume of twice the usual concentration of penicillin in oil and beeswax, that is, 0.5 cc. of 600,000 u/cc., appears entirely feasible and practical with the use of the crystalline salts of penicillin. The plasma levels obtained with this dosage were comparable to or better than those obtained with 1.0 cc. of 300,000 u/cc. calcium penicillin in oil and wax, although not quite as well sustained as those obtained with 1.0 cc. of the 300,000 u/cc. concentration of the respective crystalline salts."

Comparing the renal clearance of penicillins F, G, K, and X in rabbits and man, Drs. Eagle and Newman found that there is no difference among these penicillins in this respect. However the possibility is suggested that penicillin derivatives might be produced which would have significantly lower clearances than those of the natural penicillins so far identified and correspondingly enhanced therapeutic activity in vivo.

In view of the problem presented by the instability of penicillin, Dr. Robertson Pratt of the Research Division of Cutter Laboratories reported on the "Effect of Phosphates on Stability of Penicillin." He offered the following summary of this work:

"Deterioration of penicillin in sterile aqueous solutions is retarded by addition of small amounts of suitable mixtures of KH_2PO_4 and K_2HPO_4 or of NaH_2PO_4 and Na_2HPO_4. The effect is probably not dependent in any large measure, if at all, on the hydrogen-ion buffering capacity of the phosphates.

Phosphate Protective Action

"The protective action is observed in impure crude penicillins and in purified crystalline salts. The optimum concentration of phosphate is 0.005 M. The optimum concentrations range with respect to unitage of penicillin is relatively wide for the sodium or potassium salt but is more limited and more critical for the calcium salt.

"The phosphate may be incorporated in the saline solution to be used as a diluent for the dried penicillin, or it may be added to the concentrated aqueous solution of penicillin prior to lyophilization in appropriate quantities so that subsequent solution in the proper volume of sterile distilled water will yield a preparation with the desired concentrations of phosphate and of penicillin in saline."

Possibly of equal importance in the field of antiobiotics is streptomycin, which has already proved effective in tularemia, *H. influenzae* infections, certain cases of meningitis, bacteremia due to gram-negative organisms and certain urinary tract infections. Although streptomycin has not gained as much attention as penicillin, its

usefulness may be equally great. At present one of the most important potential uses of streptomycin is in the treatment of tuberculosis.

"This is due," Dr. H. Corwin Hinshaw and his associates at the Mayo Clinic and Mayo Foundation reported, "to the great and increasing frequency of occurrence of tuberculous infection in many countries, to the fact that no other practical and effective antibacterial therapy is available against the bacillus of tuberculosis, and to the fact that the tubercle bacillus is much more sensitive to streptomycin than are other common pathogenic bacteria. Furthermore, the tubercle bacillus remains sensitive to streptomycin for at least a few months before becoming drug-resistant, and this frequently permits realization of satisfactory therapeutic effects."

Tuberculosis Treatment

Clinical results of treatment of the various forms of tuberculosis were cited at the Symposium and it was noted that effectiveness of streptomycin is readily demonstrated in many types of tuberculous infections. Possibly most striking is the fact that until the advent of streptomycin there was no way in which the course of tuberculous meningitis and miliary tuberculosis could be modified. Now, at least temporary clinical remission is frequently realized after streptomycin treatment of early but acute and severe tuberculous meningitis. Even with streptomycin treatment, however, there has been, so far, an extremely high fatality rate among treated tuberculous patients, and the evaluation of such therapy remains a center of scientific controversy pending more extensive studies.

Summarizing the present status of streptomycin in the treatment of tuberculosis, Drs. Hinshaw and Feldman drew the following conclusion:

"Although the clinical effectiveness of streptomycin is readily demonstrated in many types of tuberculous infection, the results often are not permanent and frequently do not compare with results achieved in acute diseases treated with other antibacterial agents, such as penicillin. The limitations of streptomycin treatment in tuberculosis must be emphasized constantly in this day of 'miracle drugs,' and full consideration of the toxic potentialities of the drug must be given.

"The most uncomfortable and possibly serious toxic effects which we have noted have been those attributed to impaired function of the eighth cranial nerve, but these particular effects usually are temporary. Emphasis must still be placed on the known effective methods of treating tuberculosis, especially sanatorium care and collapse therapy. The place of streptomycin in tuberculosis therapy has not been fully determined, but it does appear to have a very great usefulness which is much more likely to supplement than to supplant the proved effective standard methods of treatment."

Although it is known that streptomycin exerts a suppressive action upon the course of various forms of tuberculosis in humans, it is necessary that an attempt be made to define the toxicity of streptomycin on long-continued administration. In a report of another study on the use of streptomycin in the treatment of tuberculosis in humans, observations made by Drs. Walsh McDermott, Carl Muschenheim, and Paul Bunn were in agreement with those reported by Hinshaw and Feldman. They further concluded that since the effectiveness of streptomycin is usually limited to four or eight weeks because of the development of streptomycin-resistant tubercle bacilli, it would seem that the greatest field of usefulness of streptomycin will be in the treatment of those forms of tuberculosis that may be permanently benefitted by only one or two months of antibacterial therapy. It appears that the largest number of such infections will be instances of early exudative pulmonary tuberculosis with or without thin-walled cavities.

Tried in Leprosy

In the treatment of leprosy, streptomycin produces encouraging results but in large and continuous dosage its toxic manifestations seem too severe in comparison with results obtained. These results were reported by Dr. G. H. Faget, Medical Director, and Dr. P. T. Erickson, Surgeon, U. S. Marine Hospital, Carville, La. They made the following conclusions with regard to the use of streptomycin in the treatment of leprosy:

"It is the impression of the writers that unless streptomycin can be further purified to render it less toxic or the effective therapeutic dose can be reduced, or a different method of administration developed, such as streptomycin suspension in oil and wax, streptomycin will probably not become the treatment of choice in leprosy.

"Further investigation of streptomycin therapy in leprosy must continue before conclusive evidence of its clinical effect can be determined.

"Streptomycin seems to be an effective agent in the local treatment of chronic leprous ulcerations. Its study in this field should be continued

by using it as wet dressings and in ointment bases to observe the best method of topical application as well as the optimal concentration for curative effect."

In addition to previously mentioned uses, Dr. G. T. Harrell and associates from the Department of Medicine, Bowman Gray School of Medicine of Wake Forest College and the North Carolina Baptist Hospital, Winston-Salem, N. C., reported on studies confirming that streptomycin is the most effective antibiotic available for the treatment of urinary infections due to gram-negative bacilli.

Other contributions at the Symposium on therapeutic use of streptomycin indicated that it will be used in larger quantities although probably not in volume comparable to penicillin.

Other Antibiotics

Important also among the new antibiotics is bacitracin which has been effectively used in severe boils, deep abscesses, infected operative wounds, carbuncles and ulcers of the leg. A series of reports on the development, properties, laboratory observations, and therapeutic applications was presented during the Symposium on Research in Antibiotics. Data on the first hundred cases of surgical infections treated locally with bacitracin was presented by a group of physicians from Columbia University. Of the one hundred cases of surgical infections treated locally, a favorable response was demonstrated in 88% of the patients.

It was noted in some cases that certain aerobic and anaerobic cocci found in these infections were resistant to penicillin and susceptible to bacitracin. Healing time was shortened in cases where penicillin and sulfonamides were used without success. Limited experimental quantities of bacitracin are being produced by the Ben Venue Laboratories of Bedford, O. The product has been steadily improved in its potency, solubility and in the decrease of its toxicity

In addition to the papers presented on penicillin, streptomycin and bacitracin, preliminary reports on several newer antibiotics—subtilin, tomatin, the actinomyces, nocardia, and eumycin—were given.

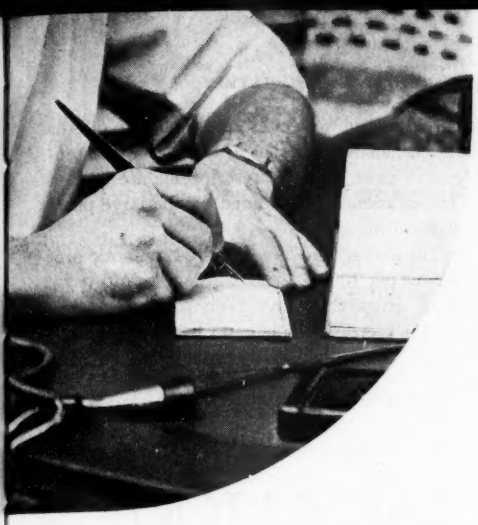
An antibiotic produced from strains of *Bacillus subtilis*, subtilin, has been shown to be effective in the treatment of a number of infectious diseases caused by gram-positive bacteria. A summary of the preliminary work using subtilin to treat experimental infections in animals was presented by D. A. J. Salle of the Department of Bacteriology, University of California. These studies indicate that subtilin is active in vivo and greatly modifies the outcome of experimental infections in animals. In mice it was found to be effective against *Diplococcus pneumoniae* Type III, *Streptococcus pyogenes*, and *Staphylococcus aureus*. It was also effective against experimental anthrax in guinea pigs. Subtilin is nontoxic to chick heart tissue and fragments cultivated in vitro; and toxic symptoms have not been observed in any of the treated animals even when given in doses as high as 100 mg. at one time. The author further states that experiments on the treatment of tuberculosis in animals with subtilin when used alone and in combination with certain sulfonamides or other compounds are still in progress and more detailed information will be released later. The results observed in these preliminary studies leave little doubt that subtilin is a powerful antibiotic of possible usefulness against a number of infectious diseases caused by gram-positive bacteria.

Tomatin, an antibiotic present in the cultivated tomato plant, has been found to inhibit (in vitro) the growth of certain human pathogenic fungi and bacteria. Workers from the Agricultural Research Station at Beltsville, Maryland, reported that tomatin is highly effective in vitro in inhibiting the human dermatophytic fungi, including species of Trichophyton, Epidermophyton, Microsporum and Achorion, and several of the fungi and yeast-like forms that cause internal disease, including species of *Monilia*, Cryptococcus, Debaryomyces, Blastomyces, Coccidioides, and Histoplasma.

Dr. Selman Waksman of Rutgers University reported on the antibiotics of actinomyces and the development of bacterial resistance. According to Dr. Waksman's classification, based on chemical properties, the following antibiotics are included in the actinomyces group: actinomycin, proactinomycin, litmocidin, mycetin, streptothricin, streptomycin, grisein, actinomycetin and micromonsporin. Dr. Waksman foresaw interesting possibilities for the future in the field of antibiotics.

"The possibility of developing new antibiotics," he said, "offers further promise of overcoming the resistance of an organism to a certain antibiotic. A combination of such two antibiotics makes also possible the complete elimination of all cells, using lower concentrations of each than would be required if only one antibiotic is employed.

"These and other problems await the attention of the chemist, the physiologist and the bacteriologist interested in this new and vital branch of science, that of antibiotics."



A PHARMACIST ANALYZES HIS PRESCRIPTION PRACTICE

by N. T. PETERSON*

FELLOW, AMERICAN COLLEGE OF APOTHECARIES

IN PRESENTING this report we recognize that it represents only one of many prescription pharmacies in the country. We must also take into consideration that much detail work is conducted by our own pharmacists with the local physicians.

This report was compiled from prescriptions received at one of our two pharmacies. During 1946 our branch pharmacy averaged 96 new prescriptions per day, while our main pharmacy has an average of 160 new prescriptions per day.

It is the opinion of the writer that professional pharmacists need not fear the near future. We find that each year physicians are writing more prescriptions to be filled—not only by us but by the majority of pharmacies in the community. Part of this can no doubt be attributed to the Food, Drug and Cosmetic Act. When many drugs were restricted by the "prescription legend," it became relatively easy to convince those patients bent on self-prescribing to seek competent diagnosis and properly prescribed treatment.

Since the return of many physicians who were in the armed forces, we find a larger proportion of U. S. P. and N. F. preparations being prescribed. It is our hope that this trend will continue.

We find that most young physicians just starting to practice are not well enough informed on the use and prescribing of drugs. We try to help them by giving each new physician a booklet† on U. S. P. and N. F. drugs, their uses, and how they may be prescribed.

Upon reviewing our prescription files we find that there has been a fairly uniform number (although a lower percentage) of U. S. P. and N. F. preparations prescribed during the past twenty years. We must also note a great increase in specified proprietary preparations that require no compounding. For the years covered by this report, the *number* of compounded prescriptions remained practically the same.

There has been a slight increase in narcotics used which the writer attributes to the introduction of Demerol. (*Continued next page*)

DATA ON PRESCRIPTIONS RECEIVED—1926, 1936, 1946

	Occurrence per 1000 Prescriptions		
	1926	1936	1946
Number of prescriptions in sample	1,000	5,000	10,000
U. S. P. & N. F. preparations	250	336	269
Proprietary or specified	331	423	552
Wendt-Bristol specified	72	87	31‡
Prescriptions compounded with 2 or more ingredients	104	108	113
Ointments compounded	23	72	17
Powders compounded	13	7	4
Capsules compounded	13	13	20
Pills compounded	3	2	0.33
Suppositories molded	5	5	0.5
Whisky on prescription	280	0	0
Vitamins	0	38	135
Penicillin			21
Narcotics	110	108	145
Hypnotics			54
Average number of new prescriptions per day	50	48	160
Average number of new prescriptions per day in 1945			147

‡ An additional detail man has now been added to the staff to stimulate the prescribing of our preparations.

Presented to the American College of Apothecaries, 1946 meeting, Pittsburgh.

* The Wendt-Bristol Co., 51 East State St., Columbus, Ohio.

† This booklet was originally distributed by the Cincinnati Academy of Pharmacy. "Useful Drugs" and the "Epitome of the U. S. P. and N. F.," both published by the American Medical Association, are also useful for this purpose.

Regarding vitamins, we find that they are more frequently prescribed, and that over-the-counter dispensing (of those allowed to be sold in this manner) is on the decrease. Although only 135 vitamin prescriptions were filled per 1000 prescriptions, they are usually expensive and tend to increase our income per prescription. Largely due to vitamins and a few other higher priced drugs, our average prescription fee is $2.10.

We find a general downward trend in our locality in the use of powders, pills, and capsules. Very seldom are we requested to make up pills or powders. In our experience, capsules are seasonable, and most capsule prescriptions are written for preparations compounded by the large pharmaceutical houses.

On the average we have filled 54 hypnotic prescriptions per 1000.

Other drugs that have been particularly important in increasing our prescription practice are penicillin and its preparations, and the sulfonamides.

IN THE A. PH. A. LABORATORY

See Front Cover

THE AMERICAN PHARMACEUTICAL ASSOCIATION Laboratory holds a unique place as the only laboratory in the country primarily devoted to development of official drug standards. Since 1938 these facilities at the headquarters building of the ASSOCIATION have been gradually expanded, increasing the services and benefits to both the profession and the public. Dr. Melvin W. Green, director of the Laboratory, is shown on the front cover of this issue using the titrimeter, most recent addition to the Laboratory's equipment. This instrument represents an improved method of making potentiometric titrations that will be applied to many investigations by the A. PH. A. staff. Almost any type of titration—acid-base, oxidation-reduction and precipitation reactions or complex-ion formation—can be conducted with greater accuracy using the titrimeter and proper electrodes.

Operation of the titrimeter depends upon the "electrical pressure," or potential, that exists when two dissimilar electrical conductors, the electrodes, are placed in a solution of an electrolyte. When a titration reaction reaches the end point there is a suddenly increased rate of change in voltage, or electromotive force. This is visually indicated by the opening of a "magic eye" mounted in the titrimeter, which is the same as the cathode tube or "tuning eye" in modern radios.

The titrimeter does away with human and chemical variables met in ordinary titration with indicators. Rapidity gives it an important advantage over other potentiometric methods.

One of the first major projects in which the instrument will be used at the AMERICAN PHARMACEUTICAL ASSOCIATION Laboratory is the determination of moisture in National Formulary drugs. Dr. Green emphasizes that the study is not aimed at changing N. F. methods for determining moisture. It will correlate and evaluate specified drying times and conditions.

For example, it is sometimes uncertain in using the gravimetric method whether weight loss stems from loss of moisture or from other factors. Some drugs may increase or decrease in weight, in the drying oven or desiccator, due to oxidation or decomposition. By correlating results from N. F. determinations with titrimeter determinations, the A. PH. A. Laboratory staff will evaluate the importance of such undesirable changes in drugs due to drying. It may be possible and desirable to specify drying times in a number of monographs, instead of drying to "constant weight."

Dr. Green indicated that the new titrimeter will also be used frequently as a referee method when there is doubt about an indicator end point or the choice of an indicator. For example, the titrimeter will be particularly useful for titrating in non-aqueous media. Here the usual *p*H theory breaks down, and it becomes very difficult to choose a proper indicator except from potentiometric data.

Dr. Green pointed out that old analytical methods are not outmoded but good instrumentation can provide many refinements that will facilitate the ASSOCIATION'S work on drug standards. With this in mind the A. PH. A. laboratory is also obtaining a spectrophotometer, an instrument that will permit exploration of many analytical problems for which facilities have not been available.

Determination of very small amounts of chemical constituents must frequently depend on spectrophotometric methods. These newer

methods are being adapted to the work of the A. PH. A. Laboratory as far as possible to meet difficult problems of drug standardization imposed by the more potent nature of modern drugs and small dosages.

Several changes are also being made in laboratory personnel. Edward N. Corbin, pharmacist of New Haven, Conn., has recently joined the staff. While serving in the Navy during the war, Mr. Corbin participated in various research projects at the Naval Medical Research Center. It is expected that additional investigators will soon be employed. Dr. Green, former chief chemist of the Laboratory, has been appointed director. Dr. Justin L. Powers, former director, retains general supervision of the ASSOCIATION'S scientific program and services as well as directing the National Formulary revision program as chairman of the N. F. Committee.

Tentative exploration of problems for National Formulary IX are already under way. Additional laboratory projects will be organized following the meeting of the National Formulary Committee on May 1 and 2.

In addition to regular National Formulary work, the A. PH. A. laboratory has been collaborating with the Scientific Section of the American Drug Manufacturers Association and with the combined contact committee of that association and the American Pharmaceutical Manufacturers Association. It has also worked jointly with the American Society of Testing Materials and the U. S. P. on standards for the durability of glass used as containers for pharmaceutical products.

Another current project of the Laboratory is aimed at establishing tolerances for dry-filled ampuls. Thousands of ampuls—involving several drugs from many lots of many manufacturers—are now being checked for weight variations. Statistical measures will be applied to this data to reach conclusions on valid official tolerances.

COMPOUND BENZOIN TINCTURE IN OINTMENTS*

by JOHN G. DOWNING and M. J. STOKLOSA
BOSTON CITY HOSPITAL MASSACHUSETTS COLLEGE OF PHARMACY

THE value of compound tincture of benzoin as a healing agent in the treatment of indolent ulcers, bedsores, cracked nipples, and fissures of the lips, the fingers and the toes has long been recognized by physicians. Although useful in many conditions if the skin is intact, local application of the undiluted tincture to broken tissues produces considerable irritation because of the high alcoholic content of the Pharmacopœial tincture. Dilutions of compound tincture of benzoin with glycerin and water have been suggested in the literature for use when the undiluted tincture is contraindicated.

Because such dilutions are pharmaceutically incompatible, ointments containing compound tincture of benzoin have gained popularity in the treatment of many conditions which do not permit application of the official tincture per se. However, the full possibilities of these preparations have not been realized, because only relatively small quantities of the tincture are ordinarily prescribed in them, owing to the inability of most ointment bases to absorb and retain appreciable amounts of liquids.

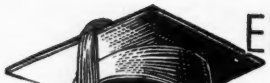
In an endeavor to determine to what extent the amount of the tincture could be increased without encountering any compounding difficulty, a series of ointments containing varying amounts of compound tincture of benzoin were prepared. Results of this investigational work indicate that by evaporation of the tincture to a thick liquid before incorporation into the ointment base relatively large amounts of tincture could be employed. The higher proportion of compound tincture of benzoin enhances the usefulness of ointments of this type.

The following formula, which was used in the preparation of the ointment for clinical investigation, indicates the extent to which the amount of the tincture may be increased by use of the procedure outlined in the following paragraph. It has been found to be of value in treatment of the dry, fissured eruption of the fingers of workers in industry who have continued to work while under treatment.

Compound tincture of benzoin.....30 cc.
Zinc oxide ointment.....30 Gm.

Evaporate the compound tincture of benzoin on a water bath to the consistency of a soft extract and incorporate, while still hot, with the zinc oxide ointment.

* Republished with permission from *Archives of Dermatology and Syphilology*, 54: 714 (December), 1946.



EDUCATION IN RELATION TO PRACTICE

by CLIFTON E. MILLER*

SCHOOL OF PHARMACY, NORTH DAKATO AGRICULTURAL COLLEGE

WHAT changes should be made in the present pharmacy curricula? Should the four-year course be lengthened by an additional year? These questions have been the subject of much debate among educators and pharmacists. This report indicates the views of a group of practicing pharmacists on these issues. The questionnaire given below was sent to a list of 136 practicing pharmacists obtained from state associations and the roster of the AMERICAN PHARMACEUTICAL ASSOCIATION, representing 35 states and the District of Columbia.

When this compilation was made, 72 replies, representing 52.9% of the list, had been received. Such a small sample obviously cannot be projected to indicate the views of American pharmacists as a group. Since many individual educators and other pharmacy leaders have publicly expressed opinions on this subject, however, it was believed of interest to report also the opinions of this group of typical practicing pharmacists.

The information obtained is given in abstract form.

Question 1: Are you a graduate of a college of pharmacy?

College graduates	60
Not college graduates	8
No answer	4

Question 2: What was the length of the curriculum in years?

Four-year graduates	24
Three-year graduates	7
Two-year graduates	29
One year or less	3
No answer	9

Question 3: If you are a college graduate when did you obtain your practical experience?

Before attending college	36
During college years	42
After college graduation	21
No answer	10

In a number of instances experience was gained and reported as a combination of the three periods specified.

Question 4: What type of drugstore are you now connected with?

Professional pharmacies	27
Retail drugstores	26
Hospital pharmacies	4
Chain drugstores	2
Manufacturing firm	1
No answer	12

Question 5: When did you decide to follow your present work or field in pharmacy?

Grade school	3
High school	52
College	7
No answer	10

Question 6: Based on your experience in pharmacy since graduation, what changes would you recommend in a college of pharmacy curriculum?

The answers to this question received were quite varied and are given in abstract form in the following paragraphs:

More emphasis should be placed on training in drugstore management, coupled with more rigid requirements for practical experience in the drugstore.

The colleges should make arrangements for interested students to obtain practical experience in hospital pharmacies.

Subjects should be stressed which will enable the pharmacist to comprehend therapeutic, chemical, and physiological actions of the more complex type of proprietaries.

More course work in the preparation of galenicals so that the manufacturer does not have it all and this fast disappearing branch of pharmacy can be brought back to the drugstore where it belongs.

Require at least one year of college mathematics.

Divide the curriculum into retail or professional pharmacy and a course designed to train the individual for teaching, research, and for manufacturing.

Introduce courses in public health and in basic principles of business administration.

Increase emphasis on interprofessional relation-

* Presented to the Section on Eduction and Legislation of the AMERICAN PHARMACEUTICAL ASSOCIATION, Pittsburgh meeting, 1946.

ships; teach less pharmacognosy and botany; and stress bacteriology, biologicals, anatomy, physiology, and enough basic medicine so that the hospital pharmacist can talk on an equal footing with the physician.

Delete courses which are of no practical value; salvage from them their good points and include them in other essential courses.

Introduce courses which will be of value in helping the druggist instruct the physician on how to prescribe official products rather than prefabricated drugs, and also a better knowledge of prescription reading.

Change the curriculum so that there will be one year of pre-pharmacy designed to act as a screening course to place the student in the field for which he is best suited.

Sufficient training should be given so that all pharmacists would be qualified to do blood and urine analysis and other tests which would be of value to the physician.

Introduce a course to train the druggist in the fitting of health appliances.

Arrange the teaching staff to have qualified personnel directing courses, rather than hodge-podge setups in which the instructor does not have the training to handle the course.

Modify the prescription practice to give sufficient time for receiving prescriptions over the telephone and also over the new type of inter-office communication systems.

Increase coursework dealing with chemistry and pharmacy of proprietaries including incompatibilities.

Introduce a suitable course in feminine hygiene for the retail druggist.

Question 7: Check the college courses which you believe would be of value to the pharmacy student.

Sixty-six questionnaires were received in which this question was freely discussed; six did not answer:

Biologicals	61	Proprietaries	39
Blood analysis	29	Public speaking	42
Bookkeeping	38	Sign writing	22
Communicable diseases	38	Toxicology	51
Cosmetics	27	Truss fitting	23
Economics	36	Urine analysis	31
Fungicides	42	Veterinary remedies	35
Photography	14	Water analysis	17

Question 8: Do you believe that pharmacy should be made a five-year course? Please state reasons.

The answers to this question are reported in two ways:

(a) Yes, 36—No, 32—No answer, 4.

(b) On the basis of the number of years attending school:

4 years of college	16 yes— 9 no
3 years of college	3 yes— 5 no
2 years of college	12 yes—15 no
1 year of college	3 yes
No college training	2 yes— 3 no

Four did not answer

TYPICAL REASONS FOR INCREASING THE CURRICULUM TO FIVE YEARS:

The five-year course should be optional at present, working to that end when pharmacy has cleared its house to the extent that five-year trained men can find employment in pharmacies that require men of that type.

It should be classed as a five-year course with four years of college and then one year of practical experience before taking the board in the field he wishes to specialize in, the apprenticeship requirements being outlined by the board.

A five-year curriculum would give the student a chance to specialize in certain subjects which he otherwise could not obtain.

It would lift pharmacy from an ordinary college course to the level of a professional course.

The present four-year curriculum is so full that no new essential courses could be offered.

It would place the student on a par with the doctor so far as the college training is concerned.

A five-year program should include premedical subjects and upon completion should grant a degree of Doctor of Pharmacy.

Professionally a five-year course would tend to raise the status of the druggist in the eyes of the physician as well as the layman.

A five-year program should be inaugurated if it will teach the student that his learning has been to further the profession of pharmacy and not for training in the lines of groceries, hardware and sporting goods.

Pharmacy is no longer an art and science that can be taught in the customary fashion dictated by various groups. Pharmacy has been complicated by the advances of the basic science upon which the profession rests. Where the basic science had one book of progress ten years ago, it now has 5, 10 or perhaps 15. The sum total of our knowledge has increased and it should follow, at least in part, that it will require a longer time to give instruction—hence the five-year program.

A five-year program will bring a still more capable group into the profession. No young person would look at pharmacy as a cheap, quick way into a profitable business; it would obviously be a more highly scientific calling.

Pharmacy implies drug production, control in production, and drug distribution—and therein is the long mile. Pharmacy colleges are not preparing students to take their respective places in this vast field of endeavor. The pharmacy student must be given training that will allow him to enter this field without question or hesitation on the part of anyone. We have all the pharmacy technicians we can use but there is a lack of *pharmacists* which only the colleges can produce through five or more years of highly

disciplined courses in professional and scientific efforts and not the "practical or playhouse courses" too frequently offered at the present time.

TYPICAL REASONS FOR NOT INCREASING THE CURRICULUM TO FIVE YEARS:

Since at present each individual uses only a small portion of what he is taught, it would seem a waste of time to require more study.

The length of the pharmacy course should depend upon the type of work the student expects to follow.

The curriculum should be revised and certain courses which are nonessential could be eliminated to provide enough time for the newer courses.

It will be a long time before the compensation of a pharmacist will justify a five-year course.

Why make pharmacy so hard; sufficient background and training can be obtained in three or four years if the courses are well arranged and the teaching staff is *competent*.

The entrance requirements to schools of pharmacy should be raised, thereby eliminating the need for a five-year course.

With the present long hours and broken shifts and pay based on common labor, there is no incentive to increase the course to five years.

If pharmacy goes to a five-year course what precisely will be taught in this extra year that will have practical merits?

The five-year course would be an added expense to the student who now has a hard enough time to go four years.

Pharmacy does not as yet have enough to offer the prosepective pharmacist to warrant him going the additional year.

A. PH. A. MEMBER BECOMES GOVERNOR

PHARMACIST Oscar Rennebohm of Madison, Wis., active member of the A. PH. A. for twenty years, has become acting governor of Wisconsin, following the death of Gov. Walter S. Goodland. He first became lieutenant governor of the state in 1944 and was re-elected last year.

The 57-year-old pharmacist-governor was born on a Columbia County (Wis.) farm. Later the family moved to Milwaukee where young Oscar graduated from high school in 1908. Following a year's experience in retail pharmacy, he entered the University of Wisconsin and graduated in 1911 with the Ph.G. degree.

The young pharmacist practiced for a year, then purchased his first retail pharmacy. Today there are 14 Rennebohm Drugstores, employing over 500 persons.

During World War I Mr. Rennebohm volunteered for military service, entering the Navy as a seaman and rising to the grade of ensign. After the war he married Mary Fowler, a friend since student days.

For many years he has taken an active part in pharmaceutical affairs: as vice-president of the AMERICAN PHARMACEUTICAL ASSOCIATION, treasurer of the National Association of Retail Druggists, president of the Wisconsin Pharmaceutical Association, and as a member of the Wisconsin State Board of Pharmacy for twenty years.

The new governor of Wisconsin is credited with giving many young pharmacists their start in the profession. He is known for many charities, active work in the Red Cross and Community Union, contributions to University of Wisconsin funds and has established five general scholarships there.

OSCAR RENNEBOHM

PRESCRIPTION *Information* SERVICE

SUBMIT YOUR PROFESSIONAL PROBLEMS TO THIS JOURNAL, 2215 CONSTITUTION AVE., WASHINGTON 7, D. C., GIVING ALL PERTINENT DETAILS. SERVICE TO READERS IS PROVIDED BY THE A. PH. A. LIBRARY AND TECHNICAL STAFF AND THE FOLLOWING CONSULTING BOARD OF PHARMACEUTICAL SPECIALISTS.

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GEORGE L. WEBSTER
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SUSPENDING SULFUR

A local doctor would like to prescribe the following mixture:

Salicylic acid
Colloidal sulfur, aa 5%
Propylene glycol, q. s.

His problem is that whereas the acid is soluble, the sulfur will form a "cake" on standing.—M. B., New York

Our laboratory has prepared the formula which you submitted, using precipitated sulfur, and in our hands the preparation is easily resuspended with only a slight amount of shaking. The suspension has now stood for about ten days without signs of the sulfur caking in the bottom of the bottle. We find that the use of 20–25% magma of bentonite N. F. in the formula improves the suspension of the sulfur somewhat, and you may find it worth while. In view of the above, perhaps your difficulty may be due to the sulfur used.

HYDRATION OF STARCH JELLY

We prepare the following starch jelly for use in urological practice:

Starch	*30 Gm.*
Boric acid	*15 Gm.*
Glycerin	*250 Gm.*
Water	*250 Gm.*

Can you suggest a procedure to prevent the above preparation from getting lumpy upon standing? When freshly prepared it is a smooth opaque liquid. —S. P., Maryland

It seems evident that the hydration reaction of the starch is not being carried to completion. When the reaction is complete a smooth jelly or paste forms, which is an opaque liquid as mentioned in your letter.

The ingredients should be mixed and then heated with constant stirring until the material is entirely translucent. At this point all of the starch grains will be hydrated, and the material will be perfectly smooth and remain so. If all the starch has not been hydrated, a gradual change takes place with eventual lumping. A sample of this preparation which has stood for two weeks is still perfectly smooth and uniform.

TEST FOR SCARLET FEVER

A physician has asked us to obtain an immune serum that can be used in the Schultz-Charlton test for scarlet fever. He tells us that such a product was used by the U. S. Navy Medical Department during the war. We would appreciate any information you may have concerning sources of this item.—A. S., Kansas

The product used for the Schultz-Charlton test is scarlet fever streptococcus antitoxin U. S. P. In this skin test the antitoxin differentiates the rash of scarlet fever from eruptions due to other causes. A small dose of antitoxin (containing not more than 2,000 to 5,000 original neutralizing units) is injected intracutaneously in the exanthematous area. A positive reaction, known as the Schultz-Charlton phenomenon, consists of

the more or less complete disappearance of the rash over an area of 2 cm. or more in diameter at the site of injection, within four to twenty-four hours.

Both Parke, Davis and Company, Detroit 32, Mich., and the National Drug Company, Philadelphia 44, Pa., market scarlet fever streptococcus antitoxin in 1-cc. vials specifically designed for use in the Schultz-Charlton test.

FORMULAS FOR BUBBLE BATH

Will you kindly supply us with formulas for a liquid and a powdered bubble bath?—G. C., District of Columbia

The following formulas for a foaming bath preparation in liquid and in powder form are taken from de Navarre's *The Chemistry and Manufacture of Cosmetics*, published by the D. Van Nostrand Company, Inc., New York City.

I

Sodium lauryl sulfate	35 parts
Sodium sesquicarbonate	63 "
Sodium alginate	2 "
Color and perfume to suit.	
	100 parts

Procedure: Mix the powders, color and perfume.

II

Triethanolamine lauryl sulfate	25 parts
Sodium metaphosphate	5 "
Water to make	100 "
Color and perfume, *q. s.*	

Sodium lauryl sulfate is a product of E. I. du Pont de Nemours and Company, Wilmington 98, Del., and sodium alginate is available from the Algin Corporation of America, 24 State Street, New York City.

In the directions for using such products it should be emphasized that the full force of the water faucet should be directly on the foaming agent to get best results.

SOURCE OF CARBOWAX

We have a formula in which "Carbowax (4000)" is called for. What is it and where can it be obtained?—P. F., Rhode Island

Carbowax (4000) is a higher glycol supplied by the Carbide & Carbon Chemicals Corporation, 30 East 42nd Street, New York City.

CONTAMINATION OF OINTMENTS

Is there any available information in pharmaceutical literature to indicate that official ointments are contaminated by manufacturing them on a marble slab?—J. M., New York

Ointment bases and ointments (not containing self-sterilizing agents) are frequently contaminated when prepared in this manner. The significance and the degree of contamination depend upon many factors, such as the type of medication, composition of the base, active ingredients, sanitary precautions during preparation, cleanliness of containers and the method and conditions of ultimate storage.

Compounding ointments on a slab without employing measures of aseptic precaution is not conducive to making available a finished preparation free from contaminants. Although we cannot offer literature references on this subject, a member of the Prescription Information Board has made a number of experimental observations supporting the above comments. Contamination sometimes occurs in bacteriological procedures even under the most rigid precautionary conditions; certainly it will occur more frequently when a careful and rigid technique is not practiced.

STABILITY OF EPINEPHRINE

We are interested in obtaining a formula for preparing a stable solution of epinephrine hydrochloride 1:1000 using epinephrine alkaloid.—R. D., New York

Preparation of solution of epinephrine hydrochloride at the prescription bench presents many difficulties, particularly when starting with the base. Epinephrine is exceedingly sensitive to oxidizing agents and is decomposed by very slight traces of iron or other metals. Moreover, the solution is subject to spoilage, due to growth of bacteria and fungi.

Remington's *Practice of Pharmacy* offers a formula, however, proposed by Scoville, which is as follows:

Epinephrine	1	Gm.
Trichlor-tertiary butyl alcohol	5	Gm.
Sodium chloride	8.5	Gm.
Diluted hydrochloric acid	3	cc.
Sodium bisulfite	2	Gm.
Sterilized distilled water, To make	1000	cc.

In this formula sodium bisulfite, as a reducing

agent, helps prevent oxidation. The trichlortertiary butyl alcohol, or chlorobutanol, is the preservative.

From what is known concerning the effect of traces of impurities in water, we do not believe there is assurance that ordinary double distilled sterilized water would be satisfactory. The water probably should be distilled and then redistilled in glass, with subsequent sterilization.

Because of various factors affecting the activity of the original base and also the instability of the finished solution under certain conditions, it would be unwise to dispense such a product unless the biological assay prescribed in the U. S. P. has been carried out on each batch by some laboratory.

Remington points out that solution of epinephrine hydrochloride must be bottled with the exclusion of air. If the solution is to be stored for any length of time, it should be bottled in containers from which the air has been removed and replaced with a non-oxidizing gas.

DISCOLORED BY IRON TRACES

I would like to know what causes the following solution to turn black after standing for about thirty minutes.—F. O., Pennsylvania

Aluminum phenolsulfonate	20.00%
Perfumed spirit, N. F.	50.00%
Oil lavender	0.25%
Ethyl acetate	0.50%
Distilled water, q. s.	100.00%

The black coloration is undoubtedly caused by traces of iron acting upon the phenolsulfonate. The traces of iron might be in any one of the several ingredients, and it will be necessary to identify and replace the contaminated ingredient. Only very small traces of iron are necessary to produce discoloration, which will vary depending upon the amount of iron represented.

A SOLUBILITY PROBLEM

How can the following prescription be compounded as a clear product? It now throws out a gum which adheres tenaciously.—E. Z., Ohio

Ether	60 parts
Tincture benzoin compound	60 parts
Thigenol	5 parts
Cignolin	4 parts

The prescription will not give a clear solution because of the difference in solubilities of the ingredients. From solubility reports in the literature, it would appear that a chloroform solution would answer the question. However, thigenol appears practically insoluble in chloroform, although it has been reported soluble. No common solvent having been found, it would seem that the prescriber had best use the thigenol and cignolin in some other form, possibly as separate prescriptions.

LIQUID CREAM SHAMPOO

Please supply a formula for a liquid cream shampoo embodying 1.5% anhydrous lanolin and 1% colloidal sulfur.—P. R., New York

The addition of any fatty material, particularly anhydrous lanolin, to a shampoo reduces the sudsing qualities to the point where the shampoo is practically worthless for the purpose intended. It is comparatively easy to add 1% of colloidal sulfur by simply getting the appropriate grade of sulfur and mixing it in with the shampoo.

To make a liquid cream shampoo, it is suggested that you prepare an emulsion of cetyl alcohol or stearyl alcohol with sodium lauryl sulfate, then add a sufficient amount of additional water and sodium lauryl sulfate to produce the desired sudsing point and concentration. The following formula will illustrate the procedure:

Cetyl alcohol	15 Gm.
Propylene glycol	10 Gm.
Beeswax	2 Gm.
Sodium lauryl sulfate*	2 Gm.
Water to make	100 cc.

Melt the fats and the propylene glycol and bring to 65° C. Dissolve the sodium lauryl sulfate in the water and bring to 65° C. Under rapid agitation add the water to the fats. When the emulsion is complete add 50 Gm. more of sodium lauryl sulfate dissolved in enough water to bring the total volume to 500 cc.

WHAT IS BAUMÉ DEGREES?

I would like to know what is meant by referring to caustic soda as 38° Be.—H. K., New York

Baumé degrees is an expression of specific gravity. The Baumé hydrometer is one of the earliest types used and the scale of degrees is purely an arbitrary one. A discussion of this

* Duponol C—E. I. Dupont de Nemours and Company, Wilmington 98, Del.

subject and the following formula for converting Baumé degrees to specific gravity is given in *Remington's Practice of Pharmacy:*

$$\frac{145}{145 - B^\circ} = \text{Specific Gravity}$$

In the example of "caustic soda (38° Be)," which you cite, application of the formula indicates that a solution of sodium hydroxide having a specific gravity of 1.3551 is indicated.

Tables in Lange's *Handbook of Chemistry* indicate that 37.5° Be (sp. gr. 1.3490)would be equivalent to 32% sodium hydroxide by weight, or 431.7 Gm. per liter. The table was calculated at 20°/4° C., but at room temperature one would not expect the correction factor to be of importance for ordinary purposes.

FORMULA FOR MANDL'S PAINT

We have an inquiry from one of our customers for Mandl's paint. Can you give us any information on the preparation?—N. D., Delaware

Mandl's paint is compound iodine paint, for which the following formula is given in *Pharmaceutical Recipe Book* III, published by the AMERICAN PHARMACEUTICAL ASSOCIATION.

Iodine	12.5 Gm.
Potassium iodide	25.0 Gm.
Distilled water	25.0 cc.
Oil of peppermint	7.5 cc.
Glycerin, a sufficient quantity,	
To make	1000.0 cc.

Dissolve the iodine and potassium iodide in the distilled water, add 500 cc. of glycerin, the oil of peppermint, and then sufficient glycerin to make the product measure 1000 cc.

Dispense with a "shake well" label.

USE OF SYNTHETIC BENZOIN

We are unable to obtain Sumatra gum benzoin due to importation difficulties. We understand that synthetic benzoin is available at the present time and we would like to know if it would be permissible to use this product in manufacturing tincture benzoin.—M. W., Ohio

Your inquiry concerning synthetic benzoin no doubt refers to a product of the Bendix Chemical Corporation, 420 Lexington Ave., New York 17, which is said to be comparable in its properties to gum benzoin.

We are unable to comment on this claim since our staff has had no experience with the product. It will be noted, however, that the U. S. P. specifies the balsamic resin, either obtained from Sumatra benzoin or Siam benzoin. Accordingly, it would not be possible to prepare an official preparation with synthetic benzoin. If, however, your medical staff is satisfied with the available evidence concerning synthetic benzoin, there would seem to be no reason why the product could not be specified on order or prescriptions.

NEUTRAL SOAPLESS SHAMPOO

Could you supply me with one or more formulae for a neutral, soapless shampoo?—N. K., Ohio

There are a number of trade-named wetting agents on the market which, when dissolved in water with or without a polyol such as propylene glycol, will produce a good soapless foaming shampoo. Thus, sodium alkyl aryl sulfonate* 20 parts, propylene glycol 5 parts, water, color and perfume to make 100 parts.

The foaming agent is dissolved in the water. The perfume is dissolved in the glycol, then added to the solution of wetting agent with stirring. The color, if any, is now added, the entire mixture blended, and allowed to stand for at least a week to allow the precipitation of colloidal material. It is then filtered bright and ready for packaging.

INCOMPATIBILITY

Can you tell me how the enclosed prescription can be prepared without a precipitate?—S. C. Wisconsin

Methenamine	10 Gm.
Pepsin	1 Gm.
Citric acid	32 Gm.
Tannic acid	32 Gm.
Magnesium oxide	4 Gm.
Sodium carbonate	4 Gm.
Distilled water, *q. s. ad*	1000 cc.

Sig: Use as bladder instillation.

Since tannic acid precipitates the pepsin and probably also precipitates the methenamine, it seems impossible to avoid incompatibility. In addition, citric acid reacts with both the magnesium oxide and sodium carbonate.

The physician may find it possible to prescribe

* Nacconol FSNO—National Aniline & Chemical Company, 40 Rector Street, New York, N. Y.

a more simple preparation, perhaps a solution of methenamine, tannic acid and citric acid. If the solution is not sufficiently dilute to avoid precipitation of methenamine, possibly another urinary antiseptic will be acceptable, such as mandelic acid or one of the sulfonamides.

DYE FOR LEG MAKE-UP

I would like to obtain the names, and where obtainable, of a brown dye for a leg make-up and a green dye for a lotion, both water soluble, stable and certified for external use.—H. K., Pennsylvania

It is difficult to answer your query specifically without knowing the formulas to be used, since incompatibility and instability of the dye under certain circumstances frequently present a problem.

For the green lotion we believe that "Exterior D and C Green No. 1" may serve your purpose, since it is reported to have a wide range of stability. This water-soluble dye cannot, of course, be used internally or on the mucous membranes. Other water-soluble certified dyes of different shades, for external use, are D and C Green No. 4 and D and C Green No. 5.

For leg make-up either coal-tar colors or the browner shades of iron oxide, including deep burnt sienna, are used. We suggest that you contact one of the following dye houses for an opinion concerning a dye with the required color and stability characteristics: Whittaker, Clark & Daniels, Inc., 260 West Broadway, New York 13, N. Y.; H. Kohnstamm & Company, 87 Park Place, New York 7, N. Y.; Ansbacher-Siegle Corporation, Rosebank, L. I., 5, N. Y.; Fezandie Sperrle, Inc., 205 Fulton Street, New York 7, N. Y.

SULFADIAZINE POWDERS

We are thinking of having a manufacturer prepare powders containing sulfadiazine and sodium bicarbonate—five grains of each to the powder. They wish to add a small amount of powdered starch to each powder, which I assume is used to prevent caking. Would it be necessary from an ethical standpoint for us to inform the physician that the starch has been added? Would it be safe to dispense a sulfa powder that has been prepared for a period of six months?—H. J., Mississippi

We see no objection to inclusion of a small amount of starch U. S. P. in the sulfadiazine powders to be prepared for your pharmacy. Such nonmedicinal excipients and diluents are included in many products as pharmaceutical necessities.

It would not be generally considered necessary from either ethical or therapeutic standpoints to advise the physician of the presence of minute quantities of such substances. It is understood, of course, that the starch will not alter the stated proportion of the active ingredients.

We do not have specific data on stability studies of sulfadiazine combinations of this type, but one would not expect any difficulty over a six-month period if the product were preserved in well-closed containers, resistant to light. The latter point would seem to be taken care of by the fact that the product will be enclosed in opaque powder papers.

AVAILABILITY OF CYTOCHROME C

Kindly send me available information and source of supply of cytochrome.—C. B., Pennsylvania

Cytochrome C is an oxidative enzyme obtained from beef hearts and to our knowledge is not yet commercially available. Investigations are in a preliminary stage. The cytochrome C used in experiments reported from the Tufts College Medical School in Boston was prepared in the laboratory of the scientists doing the work. This report may be referred to in *Science* for October 25, 1946, and was summarized in THIS JOURNAL, 8: 13, 1947.

RED VETERINARY PETROLATUM

I would like to obtain information concerning the availability of red veterinary petrolatum.—L. M., New Jersey

Red veterinary petrolatum is a refined grade of petrolatum that does not conform with U. S. P. standards. It is said to be derived from a particular type of crude oil. Red veterinary petrolatum is available from such firms as The Standard Oil Company of New Jersey.

Some comment on this product was included in a paper in the *Journal of the American Medical Association*, 130: 1 (January 5), 1946, on protective skin coatings for the prevention of sunburns. Red veterinary petrolatum was found highly effective for this purpose, but is not suitable when tanning is desired or if it is desired to have a protective that may be easily removed from the skin. Red petrolatum clings tenaciously.

Druggists' Digest

OF NEW FORMULAS, RECENT PHARMACEUTICAL DEVELOPMENTS, AND OTHER PROFESSIONAL DATA

CARNAUBA WAX CERATE

Cerates prepared from carnauba wax may be used as vehicles for active ingredients soluble in oil or oil solvents, such as salicylic acid, chlorophenols, and chrysarobin. They are unsuited to medicaments which are soluble only in water or alcohol. They should not be used on wet or exuding skin surface. Rubbed on a dry or sealing skin, cerates prepared from carnauba wax leave the surface smooth, firm, and flexible.

The following formula makes a firm wax, which spreads easily over warm skin and adheres well.

Carnauba wax	11.0 Gm.
Ceresin	1.6 Gm.
Liquid petrolatum	87.4 Gm.

Melt over free flame, add active ingredients and cool rapidly in ice-box to glaze. Peanut or other vegetable oils may be substituted for the liquid petrolatum.

—*J. Invest. Dermat., 7: 171, 1946*

PENICILLIN LOZENGES IN VINCENT'S INFECTION

Penicillin in lozenge form, 1000 units per lozenge, was used to treat 155 patients with acute gingival inflammation by Dr. Irving Glickman, Tufts College Dental School, Boston. The lozenges were administered at one and two hour intervals for a period of seven days to all but 10 patients. Placebo lozenges which contained no penicillin were administered to the latter group with no notable changes. For purposes of the experiment no other treatment was instituted.

Penicillin lozenges alleviated objective and subjective symptoms of acufe Vincent's infection and other acute gingival inflammations. The most pronounced effect was observed at the end of twenty-four hours. Penicillin lozenges were effective in reducing the severity of acute pericoronitis but produced no changes in the progress of aphthous stomatitis. Recurrence of acute gingival inflammation was noted after an apparently favorable response to treatment with penicillin lozenges had occurred. The effect of penicillin was limited to the acute aspects of gingival disease. It produced no apparent clinical change on underlying chronic inflammatory disease of the gingivae.

—*J. Am. Dental Assoc., 34: 406 (March 15), 1947*

BACITRACIN THERAPY OF SURGICAL INFECTIONS

Results of the first hundred cases of surgical infections treated with the antibiotic, bacitracin, have been reported by Drs. Frank L. Meleney and Balbina Johnson from the Department of Surgery, Columbia University College of Physicians and Surgeons, and the Presbyterian Hospital. Preliminary observations indicated that an aerobic gram-positive spore-forming bacillus produced a powerful antibiotic agent with a wide spectrum of antibacterial activity. Efforts were made to obtain the active principle in a more concentrated form and to produce bacitracin on a larger scale. The product has been steadily improved in potency, in solubility, and in the decrease of its toxicity.

A favorable response was evident in 88% of the 100 cases treated locally with bacitracin. Excellent results were reported for those cases in which the infection treated with bacitracin responded promptly within seventy-two hours. The antibiotic was injected in the form of a solution, this method being advantageous for furuncles, carbuncles, and deep and superficial abscesses, and in the form of a water-soluble ointment when longer retention of the active agent and slower diffusion was desired. Concentration of the solution varied from 2 units to 400 units per 1 cc. and the amounts injected varied from 0.1 to 5.0 cc., depending on the size of the lesion. No local toxicity or irritation was noted following the use of bacitracin.

Clinical use of this antibiotic will be important, the authors point out, only if it can succeed where penicillin or the sulfonamide compounds cannot. Its activity against many organisms of the staphylococcic and nonhemolytic streptococcic groups, which are resistant to these agents,

seems to be significant. Since it is not inhibited by plasma, blood, pus, or broken down tissue or by the organisms which produce penicillinase, it may be of value in infections due to bacterial mixtures.

—*J. Am. Med. Assoc., 133: 675 (March 8), 1947*

SYNTHESIS OF ANTIBIOTIC IN GARLIC IS REPORTED

Synthesis of the active antibiotic principle discovered in common garlic has been announced by Dr. L. D. Small and his co-workers at the Sterling-Winthrop Research Institute. In a paper presented at the annual meeting of the American Chemical Society, Dr. Small described a new series of synthetic compounds, alkyl thiosulfinates, resulting from this work. The compounds are said to be much more stable than the natural garlic antibiotics and in some instances more powerful.

"The interesting feature in these compounds," Dr. Small reported, "is that they illustrate a new key chemical structure which, when included in a large number of types of chemical compounds, imparts to them fundamental antimicrobial activity. How valuable they may be from a practical standpoint depends upon results of further biological testing."

The Sterling-Winthrop Research Institute first isolated an active antibiotic substance in garlic and elucidated its chemical structure in 1944.

FURACIN SOLUBLE DRESSING FOR CERTAIN SKIN INFECTIONS

Furacin soluble dressing—a 1:500 solution of 5-nitro-2-furaldehyde semicarbazone (furacin) in a water-soluble vehicle containing carbowax 1500 and propylene glycol—has been found to be a promising agent for use against both gram-positive and gram-negative pathogenic bacteria invading the skin. Results of a recent study using furacin have been reported by Drs. J. G. Downing and M. C. Hanson, and Marion Lamb, Department of Dermatology and Bacteriology at Boston City Hospital.

Reactions to this drug have occurred, apparently an example of the discrepancy sometimes observed between the reactions resulting from patch-testing normal persons with a cutaneous drug and reactions resulting from clinical use.

In a series of 200 normal volunteers which were patch tested with furacin soluble dressing, there was little or no sensitization of normal skin and there is no clinical evidence of toxicity from absorption of the drug when it is used in large amounts over long periods. It does not interfere with granulation or epithelization of ulcers.

The drug has value in the treatment of superficial infectious eczematoid dermatitides but must be used carefully, owing to the danger of producing sensitization on abnormal skins. In inexperienced hands the percentage of reactions may be greatly increased if the drug is used in subjects affected by mycotic infection or by industrial chemicals.

Furacin shows excellent possibilities in the treatment of superficial infection of the skin, such as impetigo and ecthyma. No therapeutic value has been demonstrated in fungous infections, industrial dermatoses, acne vulgaris and other miscellaneous dermatoses, such as psoriasis and pemphigus.

—*J. Am. Med. Assoc., 133: (Feb. 1) 1947*

FACTORS IN DRINKING WATER MAY FAVOR DENTAL CARIES

Evidence that drinking water may contain substances that make teeth more vulnerable to decay has been reported by Dr. Henry Klein of the U. S. Public Health Service, working in cooperation with Dr. J. M. Wisan of the New Jersey Health Department and Dr. John F. Cody of the U. S. Public Health Service. The teeth of 3000 New Jersey school children were examined in the study. The children lived in five communities of southern New Jersey. In three of these communities the water supplies contained enough fluorine to favor resistance to tooth decay, and in the other two, the water was considered fluorine-free.

Of the approximately 3000 children, 1307 were born in localities outside the five communities studied, but had migrated at various ages into the several communities where the examinations were made. Of those moving into the fluorine communities, the younger the child was at the time he arrived there and the longer he lived there, the less his teeth were attacked by decay. This showed the now generally recognized effect of fluorine in drinking water in favoring resistance to tooth decay. Also, among the children moving into the fluorine-free areas, the most recent arrivals had the best teeth, while those who had lived in the area the longest had the poorest teeth so far as decay was concerned.

These findings suggest that there may be factors in drinking water which make the teeth

more vulnerable to dental caries, just as there are factors which favor resistance to caries. Search for the principles in the nonfluoride waters responsible for the described effects is now actively under way. Superficial examination indicates that the nonfluoride waters in this area are acid enough to require treatment with alkali, and contain excess iron to such an extent that aeration is required to remove it. Preliminary chemical analysis indicates an unusually high content of nitrates, constituting more than one-half of the fixed residue.

—Science, 105: 4 (Jan. 3), 1947

STUDY EFFECT OF VEHICLES ON STREPTOMYCIN ABSORPTION

Clinical tests at the Temple University School of Medicine show that streptomycin suspended in peanut oil and beeswax is not absorbed from the muscles as readily as penicillin. Since the indications for slow absorption with prolonged therapeutically effective serum level are the same as in penicillin therapy, similar methods were used to study prolongation of streptomycin's action. Suspended in peanut oil and beeswax and in solvecillin (a lanolin-like substance prepared from oxycholesterins and cholesterol esters), streptomycin was administered by intramuscular injection to determine the effects on absorption and excretion.

Administering single doses of streptomycin suspended in 2 cc. of sterile peanut oil and 4% beeswax resulted in only mild local reactions, similar to those produced by intramuscular injection of like amounts of streptomycin dissolved in sterile saline. Similar results were noted when solvecillin was used as the menstruum and administered intramuscularly.

Following the administration of streptomycin by these methods, blood and urine samples were collected for assay at intervals of 1, 2, 3, 4, 6, and 24 hours.

The low serum levels and reduced urinary excretions shown in the assays indicate that streptomycin suspended in peanut oil and beeswax is not absorbed from the muscles as readily as penicillin. This slow absorption probably results in a greater fixation or inactivation of streptomycin in the tissues. Maintenance of minimum effective serum levels over a period of 6 hours required the injection of 500,000 units of streptomycin per dose.

It was noted that absorption of streptomycin administered in water-in-oil emulsions (solvecillin) was much more pronounced than that following intramuscular injections of the compound suspended in peanut oil and beeswax, but similar to that from streptomycin in saline solution.

—Science, 104 : 315, 1946

SYNTHETIC CAFFEINE COMPARED WITH COMMERCIAL CAFFEINE

In a recent study at the Lilly Research Laboratories, Eli Lilly and Co., totally synthetic caffeine was shown to produce the same degree of central stimulation and toxicity as the commercial caffeine made from a natural intermediate. Although synthetic caffeine was produced some time ago, it was desirable to have pharmacological proof of identity of totally synthetic and commercial caffeine, to supplement chemical identification.

Two types of experiments were carried out—one, the measurement of the stimulation of the central nervous system in rats; the other, the comparison of toxicitiy in mice by intravenous injection. After injecting (subcutaneously) a fixed dose of 20 mg./kg. of each drug in 0.5% solution to each of 10 rats, observations were made for four hours from the time of injection. On the following day a cross-over test was made. All tests clearly indicate that both forms of caffeine produced the same degree of central stimulation. The toxicity study showed that the median lethal dose by intravenous injection was statistically the same for synthetic and commercial caffeine.

—Science, 105: 176 (Feb. 14), 1947

ISOPROPYL ALCOHOL AS SOLVENT

Use of isopropyl alcohol N. F. VIII as a menstruum and solvent in a number of official preparations has been reported by Henry M. Burlage and Doris Bullard Hawkins in the *Scientific Edition* of THIS JOURNAL (December, 1946). Isopropyl alcohol possesses a lower surface tension, a greater fat solvent action, a more rapid killing power on many organisms, is less expensive than ethyl alcohol, and is free from taxation. Since it possesses these advantages, it has been recommended for use in the preparation of extracts where the solvent is evaporated, in the production of tablet granulations, in pharmaceutical preparations for external use, and in diagnostic stains.

In the experimental work reported, isopropyl

alcohol was used as a menstruum and solvent in ten official preparations that are prescribed most frequently. All products except aromatic elixir were prepared by official procedures.

The authors concluded that from the standpoint of ease of preparation, isopropyl alcohol was of advantage as a solvent in eight of the preparations studied.

The odor of isopropyl alcohol is an objectionable one and is not easily masked; however, benzaldehyde seems to accomplish this quite effectively.

SENSITIVITIES REQUIRE CAUTION IN USING CHICK-EMBRYO VACCINE

An allergic reaction following injection of influenza vaccine, which caused death of a child, has been reported by a Hempstead, N. Y., physician. Dr. Theodore J. Curphey, from the office of the Chief Medical Examiner, Nassau County, Meadowbrook Hospital, states that a very real danger exists in the administration of influenza and other vaccines prepared from cultures grown in chick embryo without first giving the patient a skin test to determine whether he is sensitive.

The author, explaining why there have been few deaths reported from allergic reactions in the past, states that "from available evidence it would appear that the percentage of sensitivity to egg protein in the general population is not greater than 10 per cent of the total number of allergic people. The estimate of the allergic population lies in the vicinity of 10 per cent, so that normally only one per cent of the general population can be regarded as allergic to egg protein. . . . It is known, however, that allergic children are generally more sensitive than adults."

Dr. Curphey recommends that attempts be made to purify further the various virus vaccines now becoming generally used so as to diminish the amount of reacting egg substances. He also recommends that patients receive skin tests for sensitivity to eggs and, if the skin shows a positive reaction, that the vaccine be administered in divided doses at short intervals.

In conclusion, the author states that "if the simple precautions which have been outlined are observed there should be little or no danger in continuing the vaccination of the civilian population with these agents, which the accumulated evidence shows to have definite immunizational value."

—J. Am. Med. Assoc., 133: 1062, 1947

PABA HELPFUL IN TREATING ROCKY MOUNTAIN SPOTTED FEVER

Use of *p*-aminobenzoic acid, previously found effective in certain rickettsial diseases, has been reported beneficial in the treatment of Rocky Mountain spotted fever. Dramatic clinical improvement was shown when treating a series of ten cases and comparing the results with 21 control cases. It was noted that among the patients treated with *p*-aminobenzoic acid there were fewer deaths, the length of fever time was less and less time was spent in the hospital.

Following administration of the drug in various ways to determine the most favorable mode and schedule of therapy, it was concluded that tablets (0.5 Gm.) resulted in more prolonged and steadier levels of the drug in the blood. Because of the rapid urinary excretion of the compound, oral administration at one or two hour intervals is required. Individual variation in blood levels requires the adjustment of dosage and fluid balance. Parenteral administration of *p*-aminobenzoic acid is desirable only when the patient cannot retain the material by mouth or in the comatose patient who cannot swallow. If the drug must be given parenterally, continuous intramuscular drip is the preferable method since intravenous injection results in rapid excretion.

In 21 untreated patients there were five deaths whereas in the 10 treated cases there was only one death, that being attributed to cardiorenal disease rather than the disease being treated. The length of fever in untreated patients was 17.5 days as compared to 10.5 days for those given *p*-aminobenzoic acid. Also, the untreated patients averaged twenty hospital days; those treated, thirteen days.

p-Aminobenzoic acid was administered without complication, minor toxic effects being observed only in patients receiving exceedingly high dosage.

—J. Am. Med. Assoc., 132: 911, 1946

U. S. P. DERMATOLOGIC STUDY

A critical study and research program on clinical and pharmaceutical phases of dermatologic therapy has been projected by the U. S. Pharmacopœia. As a basis for this work during the next several years, a comprehensive review is now being completed by the U. S. P. subcommittee on ointments and related preparations under the chairmanship of Prof. Louis C. Zopf, University of Iowa School of Pharmacy.

The Hospital Pharmacist

COMMENTS ON N. A. B. P. EXPERIENCE STANDARD

MINIMUM standards for evaluating practical experience requirement for licensure were approved by the National Association of Boards of Pharmacy at the 1946 annual meeting and recommended to constituent boards for early adoption. This step to give practical experience the significance it deserves has received general approval. Consensus of reaction is that the move is long overdue. Of the nine-point plan, only Recommendation 2 has brought forth any sharp difference of opinion. Hospital pharmacists have asked that this provision, as it refers to their specialty, be reconsidered. It now provides that, "To assure a well-rounded practical experience, not more than six months of credit per year shall be given for practical experience obtained in a hospital pharmacy. . ."

Because of current interest in this phase of the minimum standards, the JOURNAL prints below typical viewpoints of hospital pharmacist-readers.

S. W. Morrison, head of the pharmacy department at Wesley Memorial Hospital, Chicago, feels that Recommendation 2 puts the prospective hospital pharmacist under an unnecessary handicap as far as getting a start in his specialty is concerned. He writes:

"The recent action of the National Association of Boards of Pharmacy in recommending standards and minimum requirements for practical pharmacy experience, or apprenticeship, for pharmacists is commendable—with the exception of the position taken regarding the hospital pharmacy as a source of training.

"Having been brought up in the environment of a retail pharmacy and having served as a hospital pharmacist for many years, the need for such standards is readily understood. Many retail pharmacies will offer excellent experience for the apprentice and many others will not. Very often, the apprentice will put in his time in a pharmacy and gain very little prescription experience, even in some of the larger pharmacies.

"Our chief concern is whether the pharmacy graduate is qualified to compound and dispense medications and furnish information which may be requested by physicians or the public. His ability to manage a pharmacy is not the main issue as far as licensure is concerned.

"It is desirable, of course, for the pharmacist to have a well-rounded training in business administration, salesmanship, psychology, etc. The hospital pharmacist, in most instances, needs to be as thoroughly trained in business management as any retail pharmacist. The hospital pharmacist is responsible for the wise purchase of all drugs which may be requested. The problems involved are no different, in that respect, than in a retail pharmacy. The pharmacist is responsible for the efficient and economical functioning of his department just as in a retail pharmacy.

"Furthermore, the hospital pharmacist will gain more experience in dispensing official drugs and in manufacturing pharmaceutical preparations than will be gained in the majority of retail drugstores. . .

"We all know that there are some of the smaller hospitals that are not qualified for pharmacy training, but we also know that the same may be said of many retail drugstores. This can be covered adequately in regulations.

"It would be far better to accredit the hospital pharmacies the same as retail pharmacies and allow those who intend to go into hospital work to take their full year of practical experience in an accredited hospital pharmacy.

"There will be a number of pharmacy students or graduates who have planned to follow hospital pharmacy as their career. Is it fair to them to be denied the right to serve their apprenticeship in a good hospital pharmacy, as the proposed rules of the Boards of Pharmacy would dictate?"

A pharmacist who has just completed consecutive periods of experience in retail and hospital pharmacy expresses his conviction that there is no satisfactory reason for making a distinction between retail and hospital pharmacies, if adequate regulatory safeguards are maintained for both types of training-pharmacies. Albert L. Picchioni of University Hospital, Ann Arbor, summarizes this view as follows:

"During the past twelve months I have acquired an equal period of experience in both retail and hospital pharmacies. By so doing it has given me an excellent opportunity to compare them, and to decide for myself which of the two have provided the most well-rounded practical experience. I can truly say, beyond a doubt, that the period of time spent with the hospital pharmacy has done far more to equip me with the necessary qualifications that I will need to perform the services a pharmacist is expected to supply. Yes, it is true that the retail pharmacy did familiarize me with some of these necessary faculties, but not as completely as is being presented to me now.

"This is made more obvious by one fact alone: I am now compounding and dispensing, daily, more than ten times as many prescriptions than I was in the retail pharmacy a few months ago. And the types of prescriptions are not necessarily those taken from standard, ready-made preparations for the hospital. They are of a great variety, and many of them involve the manufacture of such preparations as capsules, powders, liniments, ointments, suspensions, emulsions, suppositories, parenteral solutions, and many others.

"Along with gaining invaluable practice in the art of compounding and dispensing to the public, I am also receiving a true picture of the business side of the pharmacy. This includes such aspects as purchasing and pricing drugs which are to be sold at retail, and bookkeeping systems.

"I firmly believe that one year of this training will provide the necessary amount of well-rounded practical experience.

Action "Not Understandable"

"It is not understandable why this training, and that obtained from other hospital pharmacies which meet the standards established by the boards of pharmacy for the practice of pharmacy, should warrant only six months' credit for practical experience per year, while that derived from retail pharmacies, which meet similar requirements, receive a full years' credit.

"I sincerely hope, along with other hospital pharmacists, that Article 2 of the plan for Practical Experience Requirements, established by the National Association of Boards of Pharmacy, will be reconsidered. It should give practical experience obtained in hospital pharmacies, which comply with regulations of the Boards of Pharmacy, full credit for experience."

Sister M. Etheldreda, representing the Greater New York Chapter of the American Society of Hospital Pharmacists, brings the question down to one of defining an acceptable hospital for training purposes:

". . . Probably the question resolves itself into a single point: Exactly what in the mind of the N. A. B. P. is a hospital? Would it not be proper to restrict or define this term? A building having 75 beds would not require the services of a full-time pharmacist. Yet, it may be labeled a hospital. The American College of Surgeons sets standards which hospitals must meet in order to be approved. The requirements regarding pharmacies are in many instances more demanding than those of State Boards of Pharmacy. Would it not be advisable to restrict hospital experience to those institutions approved by this agency?

"Let Them Show Reason Why"

"Let the Board investigate and compare retail drugstores with pharmacies located in these approved hospitals as to experience. Then, after such investigation, let them show reason why pharmacies that meet all state board requirements and supply sufficient volume and variety of experience should not be eligible as places of practical experience for apprentices."

Don E. Francke, former chairman of the American Society of Hospital Pharmacists and present editor of its *Bulletin*, holds a similar view, maintaining that Recommendation 2 represents an unwarranted arbitrary distinction:

". . . It is unfortunate that some of the discussion regarding N. A. B. P.'s Recommendation 2 has centered on those hospital pharmacies which are not operated under the supervision of a licensed pharmacist. That is about as pertinent to the topic as if someone should discuss credit for practical experience in drugstores, and then base his discussion and argument on the type of work done in licensed patent medicine stores. Obviously no one wishing to obtain experience in pharmacy would seek it in either of these establishments. The fact that there still are many hospital pharmacies that are not operated under the supervision of a licensed pharmacist is certainly an indictment against the state boards of pharmacy, which have the power to correct such conditions but still do not take their responsibility as a public health agency.

"However, there are still thousands of hospital pharmacies in the United States that are under the supervision of a registered pharmacist and provide a wide scope of professional service. If Recommendation 2 of the National Association of Boards of

Pharmacy is adopted, it will mean that full credit for experience cannot be granted to any individual who chooses to gain his experience in a hospital pharmacy. Under the ruling, the boards of pharmacy are granted no discretionary powers. Even though the hospital pharmacy far surpasses any and all basic standards for the practice of pharmacy in a state, the credit will still be limited to six months. This, of course, is the portion of the ruling to which hospital pharmacists have objections. They have no objection to the establishment of high standards for the practice of pharmacy. But they do feel that if the pharmacy located in a hospital meets all the basic requirements established by the boards of pharmacy, there is no just reason why full credit for experience should be withheld.

"Such an arbitrary recommendation as advocated by the National Association of Boards of Pharmacy is decidedly short-sighted and unfair, since it makes no provision for an evaluation of hospital pharmacy experience and disqualifies all hospital pharmacies in regard to full credit for experience, even though these pharmacies may far surpass the requirements as established by the state boards of pharmacy. Hospital pharmacists ask only that their pharmacy be given the same consideration as other establishments where prescriptions are compounded and dispensed."

NATION-WIDE BROADCAST ON HOSPITAL PHARMACY

DON E. FRANCKE

A nation-wide broadcast on hospital pharmacy was heard over the American Broadcasting Company, March 31, when Don E. Francke, chief pharmacist of University Hospital, Ann Arbor, appeared on the program "Doctors Talk it Over" sponsored by Lederle Laboratories.

Mr. Francke brought to the public a review of the development of hospital pharmacy and its important contribution to care of hospitalized patients.

Mr. Francke is president of the Michigan branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, past-chairman of the American Society of Hospital Pharmacists, and for the past three years has been editor of the Society's *Bulletin*.

Hospital Queries

CONDUCTED FOR THE JOURNAL

by JOHN J. ZUGICH

When submitting professional problems please give pertinent details. Inquiries receive personal replies, from which subjects of general interest are selected for discussion in this column. Address correspondence to the Journal, 2215 Constitution Ave., N. W., Washington 7, D. C.

STANDARD REQUISITIONS USED

What is the best method for issuing drugs to hospital wards and departments?

THE question noted here verbatim must be qualified by stating there may be no "best" method that can be applied to all hospitals. The method should depend on the type of hospital you serve.

In general, use two devices: the "prescription" and the requisition. In some institutions these are synonomous, but a demarcation might be made by the chief pharmacist. Prescriptions would be limited to materials that may be charged directly to the patient's account or are not "standard stock" on a nursing division.

Materials for internal requisition would be those commonly used on a division and whose cost would be low enough to absorb in the hospital's patient-day charge. Place limitations on drugs available (as standard stock on a unit) by considering the type of medical or surgical service represented and its frequency of use.

Avoid issuing these standard drugs except at specified hours. This minimizes confusion with other routines. By survey, determine the average number of similar medications and container sizes involved, to permit the preparation of pre-bottled and pre-labeled standard units in the pharmacy. This avoids the necessity of bottling small amounts of widely used materials individually as each requisition is received. Use a pharmacy messenger service to obtain requests for materials and distribute them at specified times daily to nursing divisions. Provide a section of the pharmacy exclusively for pre-bottled ward stock drugs and the issuance of them. If the load is heavy on this type of duty, and the personnel of the pharmacy is sufficient, channel

DATE ..... NO. PTS. ..... APPROVALS .....

Grace-New Haven Community Hospital
789 Howard Avenue

Unit ..... By .....

☐ Replacement Loss
☐ Increase in Standard

38

ACCT. NO. ..... WARD OR CLINIC ..... NURSE IN CHARGE .....

Amt.	Unit	
	1	Aminophyllin 20.cc - 0.5 Gm
	1	B-Vitamin (Thiamin), 10.cc - 0.5 Gm
	10	B-Complex Vitamin (Betasynplex)
	10	Bromsulphalein, 3.cc - 0.060 Gm per cc
	10	Caffeine Sod. Benzoate, 2.cc - 0.5 Gm
	1	Calcium Chloride, 10.cc - 1. Gm
	1	CalcGluconate(Neo-Calglucon)10.cc-10%
	1	C-Vitamin (Ascorbic Acid), 10.cc
	1	Dextrose, 50.cc - 50%
	1	Dehydrocholate Sod.(Decholin),5.cc-20%
	10	[illegible], 2.cc - 1 [illegible]

Unit	Amt
4oz	
¼oz	
¼oz	
2oz	
4oz	
4oz	
4oz	
4oz	
1pt	
1gal	
[illegible]	

Ammon. Chloride with Cod. Mixt.
Atropine Eye Solution 1% (Tray)
Atropine Eye Solution ½% (Tray)
Belladonna Tincture
Benzoin Compound Tincture
Benzoin Tincture
Bladder Mixture
Burow's Solution
Benzine
Bathing Solution
Butyn Solution 2% (T[illegible]

it to a section of the pharmacy other than the prescription window. Make it a rule that no medication is re-issued unless the container is returned or proof of breakage is submitted.

Devise a type of requisition that will supply the information you need. If pre-bottled units of standard stock drugs are used, some of the disadvantages of the older "write-in" type of requisition can be avoided. By printing a requisition

F 38N (10M 1-8-46) MJ-6-46

Grace-New Haven Community Hospital
789 Howard Avenue

Req. for Narcotics

38
N

☐ Increase in Standard

DATE ..... NO. PTS. ..... APPROVALS .....

Unit ..... By .....

ACCT. NO. ..... WARD OR CLINIC ..... NURSE IN CHARGE .....

Amt.	Unit	ITEM
	1oz	Cocaine Solution 5%
	1oz	Cocaine Solution 10%
	1oz	Cocaine Solution 20%
	20	Codeine Tablets Oral 0.008 Gm
	20	Codeine Tablets Oral 0.015 Gm
	20	Codeine Tablets Oral 0.03 Gm
	20	Codeine Tablets Hypo 0.008 Gm
	20	Codeine Tablets Hypo 0.03 Gm
	20	Demerol Tablets Oral 0.05 Gm
	1oz	Demerol Ampul-Vial 0.050 Gm per cc
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX		
	20	Dilaudid Tablets Oral 0.0026 Gm
	20	Dilaudid Tablets Hypo 0.002 Gm
	20	Morphine Tablets Hypo 0.008 Gm
	20	Morphine Tablets Hypo 0.01 Gm
	20	Morphine Tablets Hypo 0.015 Gm
	1oz	Opium Tincture
	20	Pantopon Tablets Hypo 0.02 Gm
	1oz	Papaverine Ampul-Vial 0.03 Gm per cc
	20	Papaverine Tablets Oral 0.1

DO NOT USE	Quan.	Unit	Write In Items

IMPORTANT

Completed and signed Record of Narcotics, Form 821 and empty containers for each item requested shall accompany this requisition.

similar to the type shown in the illustrations, time is saved by nurses in ordering; specifications will be clearer and the monthly recapitulation (of materials issued) will be simpler. Nurses indicate amounts of a drug desired by merely inserting a number, thus avoiding those improper specifications.

Monthly issuances to a ward or department need not be tabulated individually, item by item. All requisitions from a single department are placed one over another on a "peg board" (Wilson Jones Co., Chicago), so that only the right-hand column of each sheet is visible. Punch-holes at the top of the form make this a simple operation. The horizontal rows of figures for each item can be added quickly to give the total units charged to the department for the month. These are entered on a master sheet. (Even stenciled forms may suffice if perfect alignment can be achieved.)

Additional supplies that may be standard only on specialized floors can be entered in the "write in" column of the requisition form and can be priced individually. All drugs frequently issued directly to departments can be printed on one sheet. If different requisitions are needed for special departments, these can be printed on paper of a distinctive color. Thus in the latter instance, nursing division drugs may be on one form; clinic, anesthesia, operating room, public health, first aid, etc., can be on different requisition forms. All follow the same general plan.

DETERMINING DRUG CHARGES

What is the favored method for charging drugs to hospital wards and departments?

The method for charging drugs that are standard (nonprescription materials) to nursing divisions and departments depends mainly on what information your comptroller or accounting de-

partment may desire. Several approaches used in various hospitals will be mentioned.

(1) Drugs issued to the departments for stock might be charged at actual cost plus an additional percentage to cover the pharmacy's operating expenses devoted to the issuance of these materials. The major portion of the operating expenses is determined by ascertaining the man-hours spent daily in issuing drugs directly to the departments.

(2) Another approach is to issue ward or departmental drugs at actual cost plus the monthly operating expense reflected in pro-rated charges to each unit based on the number of items issued to it.

(3) Several hospitals merely charge drugs at actual cost to departments and disregard any added percentage. They consider it a paper or book figure which distorts cost. The reasoning is that the hospital pharmacy is a "service" department and the cost of issuing ward drugs is absorbed as a hospital expense.

(4) A common practice, not in favor in some circles, is to add 10% to the actual drug cost as sufficient to cover the cost of issuing materials. In some hospitals with all-inclusive rates this percentage may not measure up, since the majority of the medications are issued directly to the nursing divisions and no actual monies are received.

In turn, "actual cost" could mean many things. Generally, it would mean the purchase price of drugs if they are obtained from outside sources in their finished or dispensing form. If a drug issued was manufactured in the pharmacy, factors such as cost of bulk materials, labor, depreciation of equipment, etc.—all factors which the comptroller or accounting department may wish to consider—are used to determine actual cost of materials as dispensed in finished form. In brief, the charges for drugs are not merely a vindication of your department, but must also serve their true function to the hospital, i. e., determination of cost per patient day.

Thus if the hospital pharmacy is operated as a service unit of the hospital, drugs for floor stock had best be charged at actual cost, as indicated in No. 3.

A.S.H.P. ELECTS OFFICERS FOR 1947–48 TERM

RESULTS of the election for 1947–1948 officers have been announced by the American Society of Hospital Pharmacists. John J. Zugich of New Haven, Conn., is chairman-elect; Margaret S. Gary of Norfolk, Va., vice-chairman-elect; Leo F. Godley of New York City, secretary-elect; and Sister Etheldreda of New York City, treasurer-elect.

Officers for the coming year were elected by mail ballot of the Society's active membership and will be installed at the annual convention to be held in Milwaukee the week of August 24, 1947.

Mr. Zugich, the chairman-elect, is chief pharmacist of New Haven Hospital, teaching affiliate of the Yale College of Medicine. At University Hospital, Ann Arbor, he served as supervisor of both the laboratory and dispensary. Later, as chief pharmacist at Oak Ridge (Tenn.) Hospital, Mr. Zugich developed the hospital pharmacy department that served the new "atomic bomb city." He has been a frequent contributor to THIS JOURNAL and other professional publications.

Ballots for the election were tabulated by three members of the Society appointed by Chairman Hans S. Hansen: Irvin Friesen, Takoma Park, Md.; Sister Lydia Spain, Washington; and Miss Gloria Niemeyer, Washington.

JOHN J. ZUGICH, CHAIRMAN-ELECT

Science News Capsules

TICKS, BEDBUGS, AND FLEAS may spread undulant fever. How humans sometimes get the disease without contacting infected animals or drinking raw milk has heretofore been a mystery. Studies at the Institute of Health and Tropical Medicine in Mexico City show that ticks, bedbugs, and fleas became infected with the Brucella organisms from laboratory animals and passed the infection along to healthy animals. This means that insect control probably will become a new adjunct to control of undulant fever.

INFANTS born with glaucoma may be saved from blindness. Operation devised by Dr. Otto Barkan of San Francisco, and reported to the American Medical Association, restored vision in 66 of 76 cases.

PHYSICIANS became better physicians after taking an experimental short course in psychotherapy. They were happier. They stopped blaming patients for neurotic behavior and themselves for failing to find organic causes of symptoms. These are the conclusions of physicians who took the course at the University of Minnesota. The annual report of the Commonwealth Fund, which supported the project, comments that "this course demonstrated to a receptive group of good doctors that there are forces inherent in the relationship between physician and patient which, properly understood and humbly used, could revolutionize medicine as it is commonly practiced."

THE JEWETT NAIL has reduced mortality from broken hips in elderly patients from 40% to 12%, Dr. Mather Cleveland and co-workers reported to the American Academy of Orthopedic Surgeons. Moreover, the period of hospitalization has been almost halved and cost to the patient equally reduced. The Jewett nail, a combination of a three-flanged nail and bone plate, is screwed firmly to the shattered bone after it has been put back in place by an operation. No traction is necessary.

TURPENTINE and rosin production can be increased by deliberately inoculating pine trees with a species of Fusarium, a plant-disease fungi. Yields of oleoresin are far larger than from uninfected control trees, Dr. G. H. Hepting of the U. S. Department of Agriculture reports. Further tests will show whether there are long-term ill effects on trees that would offset this advantage.

A WINNOWING PROCESS to separate quickly curable psychiatric cases from resistant ones has been developed by University of California's Langley Porter Clinic. Basis of procedure: analyzing results from Rorschach ink-blot test and Minnesota Multiphasic Personality Inventory. Overcrowded mental clinics should benefit, where psychiatrists are at a loss to predetermine which patients would be most responsive to treatment.

TYROSINE, an amino acid, has been synthesized with radioactive carbon at the University of California Radiation Laboratory. One tracer study with the substance will be aimed at the melanomas. Such cancers are black because of melanin, which perhaps is synthesized in the body from tyrosine. The exact relationship may be clarified by metabolic studies of radioactive tyrosine.

THE PUNCTULE, a new device for injecting Romansky-formula penicillin, has been developed by Dr. Martin Lasersohn of Winthrop. The glass and neoprene unit, equipped with a double-end 21-gauge needle, slips into the barrel of an ordinary hypodermic syringe. Advantage claimed is more reliable aspiration when injecting opaque fluids, such as P. O. B. The medicament does not go into the syringe until after aspiration so that any aspirated blood will be clearly visible.

LARGEST TELESCOPE in the world, now being completed at Mount Palomar in California, will begin sweeping the skies before the end of 1947. Grinding of the 200-inch lens—delayed more than four years by the war—is nearly finished. Total cost: $6,250,000. The instrument will project man's sight into the universe two times farther than it has ever gone before—to a distance more than a billion light-years away. It will open up an unexplored sphere eight times the volume hitherto observed.

TUNGSTEN WIRE for special amplifying tubes can now be drawn so fine that it is invisible to the naked eye. One pound of the wire in a single strand would stretch 950 miles.

TEST FOR PREGNANCY that tells with fair accuracy how many weeks have elapsed since conception, has been developed by Dr. E. W. Page at the University of California Medical School. It is a biochemical method based on the blood level of pitocin (secreted by the pituitary). Something in the blood of pregnant women destroys this substance; Dr. Page postulates the existence of an enzyme he calls pitocinase. Advantage of the test is quantitative rather than qualitative. For a simple "yes-or-no" report, the Friedman or Aschem-Zondek test requires less time and skill.

OF 300,000 ORGANIC CHEMICALS now known only 3% are currently useful, Hoyt M. Corley of Armour and Co. research department, estimates. Of 9000 chemicals now useful, it is estimated that only 5000 are being manufactured in the United States. Three reasons why so many chemicals have not been developed commercially: (1) They have not been properly promoted. (2) Civilization has not progressed sufficiently to use them. (3) Production costs are prohibitive in relation to functions performed.

PRICES FOR RADIOISOTOPES have been revised by the Atomic Energy Commission. Carbon 14, important in pharmaceutical and medical research, drops from $367 per millicurie to $50. Additional isotopes have dropped sharply in price while others are somewhat higher.

AN ASPERGILLUS MOLD, called SD-17, produces an antibiotic effective against brucellosis organisms in vitro. Credit for the discovery goes to Dr. G. A. Beal of the University of Chicago. Further studies in animals will show whether this chemical appears to have any practical value. A more effective treatment for undulant fever would be welcome, since incidence of the disease appears to be on the increase. Reported cases are 50% higher this year than last.

MIDGET RADIO RECEIVER the size of a calling card has been developed by Dr. Cledo Brunetti of the National Bureau of Standards. A two-inch speaker completes the unit. The pocket receiver is based on processes and materials used for the wartime proximity fuze. A pocket-size transmitter has also been built by Dr. Brunetti, who predicts that personal intercommunication by broadcasting is on the way.

PLUTONISM is a new disease of the atomic age described by Dr. A. M. Brues of the Argonne National Laboratory, Chicago. Caused by plutonium, the effects are graying hair, liver damage, and bone cancer. Existence and nature of the disease was demonstrated in laboratory animals, but no known human has been thus affected.

PSYCHOMOTOR EPILEPSY is much more prevalent than has been supposed, according to Dr. C. D. Aring of the University of California Medical School. In this type of seizure an emotional disorder is a frequent manifestation, sometimes accompanied by violent acts. When recognized the disease responds to administration of dilantin and/or phenobarbital.

REMAINS of America's earliest known human being have been unearthed near Mexico City. Estimated age: 10,000 to 15,000 years. The find was made by borrowing a modern method of prospecting for oil and ores called earth conductivity.

PROPHYLACTIC USE of penicillin and sulfadiazine has reduced the mortality from acute appendicitis operations from 4.3% to 0.9% at Cook County Hospital, Chicago (*J. Am. Med. Assoc.*, 133: 907, 1947). There is also less morbidity, patients are more comfortable, and the period of hospitalization is shorter.

NEW SALT SUBSTITUTE, called "Neocurtasal," has been developed by the Winthrop Chemical Co. for patients on a salt-free diet. It consists of potassium chloride, ammonium chloride, potassium formate, calcium formate, magnesium citrate, and starch. The product contains no sodium but has a salty, palatable flavor.

LEVULOSE is now available for the first time in sufficient quantities for the needs of experimental work in medical and biological science. A pilot plant at the University of Colorado, operated on a grant from the Sugar Research Foundation, obtains levulose from sucrose by an ion exchange process. It is said to be the only commercially feasible method in actual operation.

TWO NEW AND UNDISCOVERED particles that have no weight or mass may actually exist. Relativistic wave equations suggest this possibility, Dr. E. P. Wigner, head of the Clinton Laboratories at Oak Ridge, has reported to the American Physical Society. One of these theoretically massless particles is thought of as analogous to transverse sound waves, and the other to longitudinal sound waves; both would have the velocity of light.

GRISEIN is the name given to a new antibiotic obtained from Streptomyces griseus, soil organism that also yields streptomycin. Discoverer of grisein, Dr. Selman A. Waksman, doubts that it holds promise as a separate antibacterial agent, but suggests possibilities for use combined with streptomycin to avoid development of streptomycin-resistant bacteria.

ACCURATE WEATHER FORECASTS several months in advance might result from further study of the relation between weather and solar activity, Dr. B. Haurwitz of M. I. T. believes.

PRESIDENT TRUMAN'S MESSAGE ➡

President Truman's message to the AMERICAN PHARMACEUTICAL ASSOCIATION on the occasion of National Pharmacy Week, reproduced on the facing page, has been quoted in the lay press throughout the country. It reflects the general recognition given to this year's program dedicated to public education on cancer control, in which more than 16,000 pharmacies participated. A detailed report on this most successful of all National Pharmacy Week observances will appear in a future issue.

The National Pharmacy Week Committee reminds pharmacists that photographs to be entered in the display competition must be submitted to their state association office by May 26.

THE WHITE HOUSE
WASHINGTON

March 31, 1947

Dear Dr. Serles:

I am glad to note that the pharmacists of the United States will observe National Pharmacy Week from April twentieth to twenty-sixth next. The pharmacist plays an important role in our public health program. Many of our citizens go to the neighborhood pharmacy for help in time of illness. The fact that pharmacists there employed are in a position to advise patrons where to go for diagnosis and treatment adds materially to the service available to the sick.

I congratulate the American Pharmaceutical Association on this twenty-first annual observance of National Pharmacy Week and trust that the pharmacists of the Nation will continue to extend their efforts designed to improve the public health by making available to all of our people fruits of modern pharmaceutical research resulting in the development of standardized remedies for the treatment and prevention of disease. You have my best wishes for the success of this undertaking.

Very sincerely yours,

Harry Truman

Dr. E. R. Serles,
President,
American Pharmaceutical Association,
2215 Constitution Avenue, N. W.,
Washington 7, D. C.

NNR

PRODUCTS RECENTLY ACCEPTED BY THE A. M. A. COUNCIL ON PHARMACY AND CHEMISTRY

PENICILLIN (See New and Nonofficial Remedies, 1946, p. 212).

The following dosage forms have been accepted:

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Penicillin Sodium: 500,000 units.

LAKESIDE LABORATORIES, INC., MILWAUKEE

Penicillin Sodium: 20-cc. vials containing 200,000 and 500,000 units.

Penicillin Calcium: 20-cc. vials, 200,000 units.

THE WM. S. MERRELL COMPANY, CINCINNATI

Penicillin Sodium: 500,000 units.

CHAS. PFIZER & CO., BROOKLYN

Penicillin Calcium: Bulk. Marketed in bottles containing approximately one billion units each.

Penicillin Sodium: Bottles containing 200,000 and 500,000 units.

Crystalline Penicillin Sodium: 100,000, 200,000 and 500,000 unit bottles and bulk in bottles containing approximately 1 billion units.

SECONAL SODIUM (See New and Nonofficial Remedies, 1946, p. 534).

The following dosage forms have been accepted:

ELI LILLY & COMPANY, INDIANAPOLIS

Suppositories Seconal Sodium: 0.2 Gm.

Seconal Sodium Ampuls: 0.25 Gm. and 0.5 Gm. Dry powder used to prepare a 5 per cent solution by by the addition of 5 cc. or 10 cc., respectively, of sterile distilled water.

Seconal Sodium Elixir: Each 100 cc. contains approximately 0.44 Gm. of seconal in a vehicle containing alcohol, glycerin, water and aromatics; methenamine is present for the purpose of increasing the solubility of the seconal.

COUNCIL REPORTS

POSSIBLE DANGERS OF TETRATHIONATE THERAPY OF THROMBOANGIITIS OBLITERANS

About ten years ago Rabinowitz[1] and Rabinowitz and Kahn[2] introduced the use of thiosulfates in the treatment of thromboangiitis obliterans. Bancroft and his associates[3] have reported studies on the effect of sodium thiosulfate on the clotting index of the plasma and fibrinogen content of the blood. They concluded that the morbidity due to postoperative thrombophlebitis could be reduced by the prophylactic injection of sodium thiosulfate combined with a diet low in fats and proteins.

Theis and Freeland[4] proposed the use of sodium tetrathionate ($Na_2S_4O_6.H_2O$) in place of sodium thiosulfate ($Na_2S_2O_3.5H_2O$) in the treatment of thromboangiitis obliterans. Apparently the assumption was made that the toxicity of tetrathionate and that of thiosulfate were essentially the same. The usual intravenous doses employed were 1.0 Gm. of sodium thiosulfate and 0.885 Gm. of sodium tetrathionate and no side reactions or signs of toxicity were reported, although it must be admitted that no serious effort was made to detect subclinical toxicity in the patients treated.

Chen, Rose and Clowes[5] report the lethal dose of sodium tetrathionate in the dog as 1.0 Gm. per kilogram. Cacciavillani[6] found, however, that this substance is much more toxic in the rabbit. Recently Gilman and his associates[7] have reinvestigated the toxicity of tetrathionate, particularly with reference to its mechanism of action.

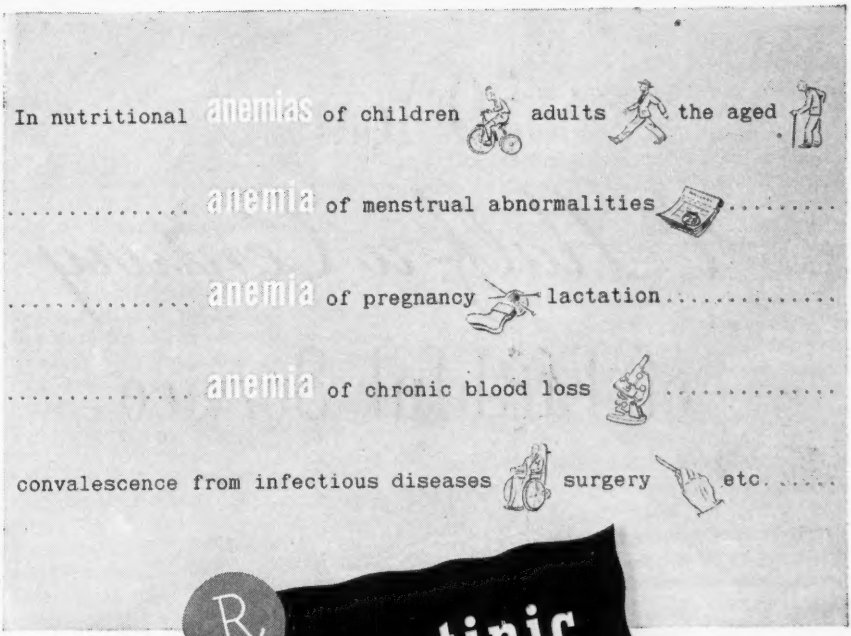
Gilman and his co-workers showed that tetrathionate can be reduced to thiosulfate in vivo, but the thiosulfate so formed is frequently retained and not excreted as is thiosulfate introduced directly into the body. They also showed that tetrathionate can oxidize mercaptans in vitro and presented evidence to show that such oxidation probably occurs in the body.

In the dog the intravenous LD_{50} for tetrathionate was determined to be about 250 mg. per kilogram and for the rabbit about 75 mg. per kilogram. All animals die from renal failure due to severe necrotizing lesions of the proximal convoluted tubules. With doses of 300 to 500 mg. per kilogram, signs of acute renal damage, as evidenced by complete anuria, may occur within thirty minutes after the intravenous administration of sodium tetrathionate.

Gilman and his associates present two possible theories to explain the severe nephrotoxic action of tetrathionate: (1) Tetrathionate selectively permeates the cells of the proximal tubule to exert a direct toxic action on catalytic systems dependent on the presence of —SH, or (2) the cells of the proximal tubules are selectively damaged by the removal of diffusible —SH compounds.

As an explanation of why toxic effects have not been reported in human beings treated with tetrathionate, Gilman points out that most commercially available tetrathionate contains large amounts of thiosulfate and that the recommended doses are low. Nevertheless, the importance of maintaining the integrity of the —SH group in the body has been emphasized by recent studies on arsenic and mercury poisoning, and any drug which has potentialities for the destruction or interference with these groups must be considered as toxic and its use must be carefully limited. Moreover, the substantial evidence of nephrotoxic effects from the use of tetrathionate furnishes a convincing reason that the use of this agent in medicine should be abandoned.

1. Rabinowitz, H. M., *J. Chemotherapy*, **13**: 1, 1936.
2. Rabinowitz, H. M., and Kahn, J., *Am. J. Surg.*, 31: 329, 1936.
3. Bancroft, F. W.; Stanley-Brown, M., and Chargaff, E., *Ann. Surg.*, 106: 868, 1937.
4. Theis, F. V., and Freeland, M. R., Thromboangiitis Obliterans, *Arch. Surg.*, 40: 190 (Feb.) 1940.
5. Chen, K. K.; Rose, C. L., and Clowes, G. H. A., *Am. J. M. Sc.*, 188: 767, 1934.
6. Cacciavillani, B., *Bull. Soc. Ital. Biol. Sper.*, 11: 756, 1936.
7. Gilman, A.; Philips, F. S.; Koelle, E. S.; Allen, R. P., and St. John, E., *Am. J. Physiol.*, 147: 115, 1946.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Typical Days

FROM THE SECRETARY'S FEBRUARY DIARY

—1st to 3rd—

ALL these days working with the staff individually and collectively to perfect routine procedures and plan membership campaigns, National Pharmacy Week activities, and contacting the various groups in the profession and industry that present the over-all picture of pharmacy to the public.

—4th—

On to Newark, N. J., for an important meeting of the Committee on National Pharmacy Week. Here in Dean Tom Rowe's office, at Rutgers University College of Pharmacy, were gathered Jean Henderson, Bert Mull, Tom Rowe, and Robert P. Fischelis of the Committee. Final decisions reached upon the display to be supplied to the pharmacies of the U. S. that have decided to cooperate. A fine meeting with Tom Rowe presiding and everyone agreeing that 1947 National Pharmacy Week should be tremendously successful. Now to the Pennsylvania Hotel in New York to meet with the Board of Directors of the American Social Hygiene Association.

—5th—

After an early breakfast with Ad-man Charles O'Malley, a short meeting with Executive Director Clarke of the American Social Hygiene Association, and then to preside over the annual meeting of the Association on this "Social Hygiene Day." Later to the annual luncheon of the A. S. H. A., which filled the large Pennsylvania Hotel ballroom. After a flying visit to Bob Swain's office to discuss military affairs related to pharmacy, boarded the "Congressional" for Washington where the desk was piled high as usual.

—6th—

At the routine tasks and preparing for the hearing before Subcommittee No. 9 of the Armed Services Committee of the House of Representatives. The decisions of this Committee may largely determine what will happen to the Pharmacy Corps.

—7th—

Today, in company of Swain and Frates, to a hearing on the Surgeon General's proposal to organize a Medical Service Corps in the Medical Department of the Army. Later a brief contact with Secretary Barta of the Proprietary Association, who still fights state legislation restricting drug dispensing to those qualified by education and law to discharge this function. And now departing for Philadelphia to meet Dr. Austin Smith for dinner at the Bellevue and post prandial discussions of medico-pharmacal relations.

—10th—

Many hours spent on the Army and Navy legislative proposals involving pharmacy. Also a final decision to purchase nearly $3000 worth of new equipment to enable us to do more and better duplicating of letters and printed matter—a necessary step to modernize office procedure and to permit rapid and economical dissemination of information to our members.

—11th—

Early in the morning leaving Washington on the 7 o'clock train for Newark, N. J., and then to Trenton for the State Board of Health sessions. Departed in time for the return to Washington yet today, meeting R. L. Swain en route, and spending the hours very profitably in discussion of military and other pharmaceutical problems.

—12th—

An all-day meeting with the Committee on Status of Pharmacists in the Government Service listening to Colonels Kintz and Michaelis, of the Office of the Surgeon General and the General Staff, respectively, who came to discuss amendments to the Medical Service Corps bill that would make it acceptable to pharmacists. The Committee's reaction was embodied in a letter to the Surgeon General. At night

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•

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to dinner at Hogates with Dean D. B. R. Johnson of Oklahoma, Swain and DuMez.

—13th—

In the morning to Surgeon General Kirk's office with Swain, Foss, Bohrer, D. B. R. Johnson and Frates to review proposed amendments to the Medical Service Corps bill, and there seems to be a possibility of a meeting of minds. To lunch at the Roger Smith Hotel with Assistant Surgeon General R. C. Williams and Dr. Otis Anderson of U.S.P.H.S. and H. A. K. Whitney, discussing hospital pharmacy problems. In the afternoon came the 459th magazine writer looking for scare-head material about barbiturates. We sometimes complain about imitation of drug specialties among manufacturers, but magazine writers apparently have no code to prevent duplication of reading matter ad infinitum and ad nauseam.

—14th—

Glad to welcome W. B. Shangraw of Vermont, who called to say hello on his way back to Vermont from points south. Much of the afternoon going over a program of facilities and supplies for pharmacies in a 100-bed hospital with Drs. J. R. McGiboney and L. Block and Messrs. G. H. Trimble and A. M. Milne of the U. S. Public Health Service.

—15th—

An early morning trip to Newark, N. J., to see the dentist and then to confer with John Winter who will handle our JOURNAL advertising. And now a weekend visit from H. A. K. Whitney at Red Bank, discussing hospital pharmacy and what not.

—17th—

The hearings on the Army Medical Service Corps and Navy proposals affecting pharmacy continue. Much telephone conversation at long distance with Swain, Einbeck and others as to the next steps in this important development. It is interesting to hear the reports of comment on Army and Navy pharmacy offered by those who know little about the general Army and Navy upheaval that is going on. They still seem to believe that one can create a corps by merely passing a law and make it function by wishful thinking.

—18th—

Today a visit from K. L. Hills of the scientific staff of the Australian Embassy, who proposes closer liaison with U. S. scientists in pharmacy and allied fields. Also a visit with Dr. Lindholm of the Danish Pharmaceutical Society. Much overtime activity with the staff on pressing organizational problems.

—19th—

This day dividing the time between a hurriedly called meeting of the Congressional committee dealing with pharmaco-military matters and engagements with Dunning and DuMez in Baltimore.

—20th—

More discussion of the Medical Service Corps before the Congressional committee, with plenty of

(*Continued, page 233*)

FOR WANT OF A NAIL A SHOE WAS LOST!

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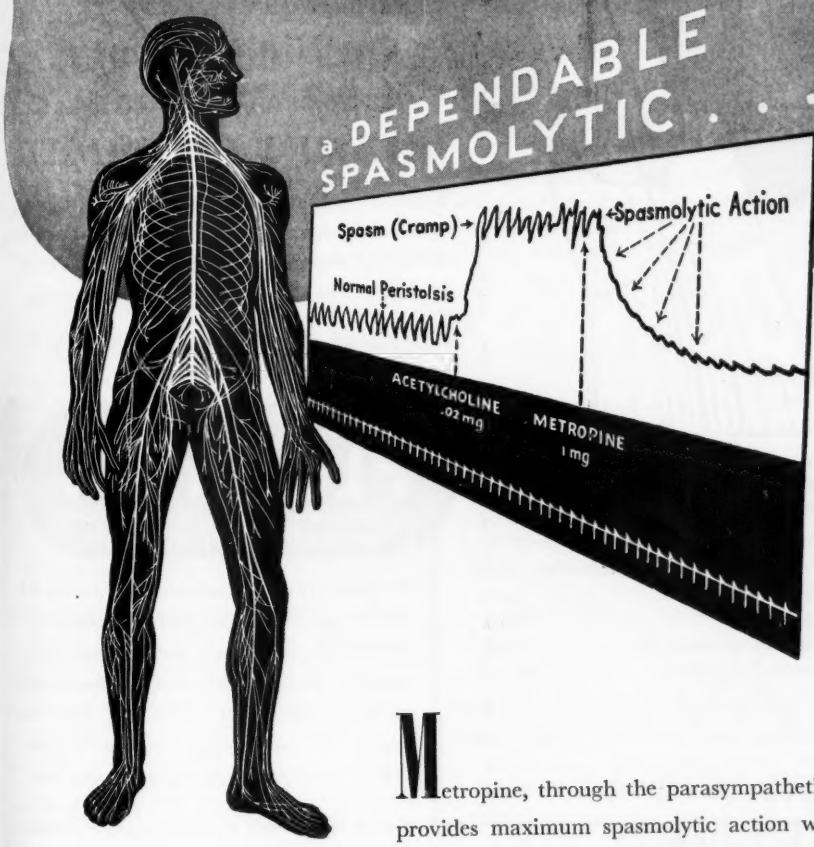

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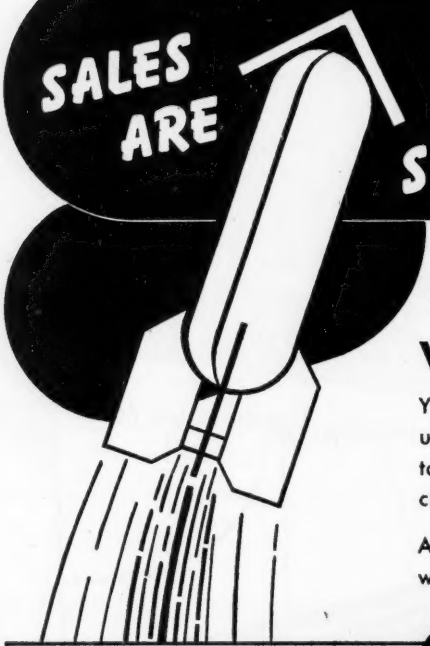

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Vitamin B6 (pyridoxine) hydrochloride	2 mg.
Calcium pantothenate	10 mg.
Nicotinamide	150 mg.
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Army and Navy brass in evidence. The Surgeons General of the Army and Navy and their top staff officers are giving personal attention to this legislation. Pharmacist-Congressman Durham of N. C. continues to be the mainstay of the profession in these discussions, ably assisted by Congressman Rivers of S. C. The charming Congresswoman Margaret Smith of Maine, chairman of the Subcommittee, conducts the hearings very ably and with scrupulous fairness.

After the formal session, an informal meeting with Swain, DuMez and Einbeck, digging deeply into the possibilities and probabilities of the various proposals now before the Congressional committee. No one minimizes the effects of the Army and Navy proposals on the future of pharmacy, and it is very plain that neither the military nor the pharmacists will make the final decision. It will be Congress that will decide.

—21st to 23rd—

Clearing the desk in preparation for the meeting of the U. S. P. Subcommittee on Scope, which will work on the admissions and deletions for U. S. P. XIV even before U. S. P. XIII is actually published Such is the accelerated program of U. S. P. revision.

—24th to 25th—

These days in Atlantic City at Haddon Hall with the 17 distinguished physicians and 5 pharmacists who make up the U. S. P. Committee on Scope. The sessions go on morning, noon, and night with brief recesses for meals and occasional pauses that refresh. One learns much of the conflict between pharmacologists and clinicians in these meetings, but it becomes more evident all the time that clinical "evidence" is still considerably a matter of opinion of the clinician. Those who know how to collect and evaluate evidence are still too few in number. Austin Smith has recently joined this Committee and adds great strength to its deliberations. Drs. Long and Thorn were greatly missed.

Late on the 25th to the Chemists Club in New York to discuss iodine research with Swain, Beal and Schaefer, and then with Swain on the B. & O. sleeper to Washington for further hearings on the military legislation.

—26th—

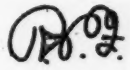
This day the pharmacists were heard on the proposals of the Army to substitute the Medical Service Corps, Pharmacy Section, for the present Army Pharmacy Corps. Swain and DuMez handled the situation splendidly and were interrogated at length by the Congressmen. There can be no question in the minds of the latter as to what pharmacists think about this situation.

—27th—

The hearings continued with Admiral Swanson presenting the Navy proposals for adding commissioned pharmacists to the Hospital Corps. We presented a brief in behalf of Chairman Hansen of the American Society of Hospital Pharmacists, protesting the integration of commissioned pharmacists in a mixed corps like the Hospital Corps and requesting a separate corps or section for commissioned pharmacists. The resulting argument became spirited at times, but the pharmacists' point sank in on the committee.

—28th—

A visit from N. F. Committee member A. R. Granito, and pleased to join Dr. Powers in accompanying him and Mrs. Granito and son for the youngster's first visit to the tomb of the unknown soldier at Arlington. We arrived just in time to observe the change of guards, a most impressive ceremony.



I. A. BECKER AND W. J. GRAY DIE, VETERAN HOSPITAL PHARMACISTS

Irwin A. Becker, life member of the AMERICAN PHARMACEUTICAL ASSOCIATION and chief pharmacist at Michael Reese Hospital, Chicago for forty years, died March 13. He was seventy-four years old. Although retired in 1942, Mr. Becker resumed active practice during the war emergency to take charge of the pharmacy at Evangelical Hospital.

This is the second veteran hospital pharmacist of Chicago to be lost to the profession within six months. Seventy-nine year old William J. Gray, who died last September, was chief pharmacist at Presbyterian Hospital, Chicago, for thirty-five years. He was a life member of the AMERICAN PHARMACEUTICAL ASSOCIATION and for many years a leader in the A. PH. A. Chicago branch. He is said to have been the first pharmacist in America to hold classes for student nurses.

L. E. WILL MEMORIAL FUND GIVEN TO A. PH. A. BRANCH

The newly established local branch of the AMERICAN PHARMACEUTICAL ASSOCIATION at Milwaukee has been given a fund of $729 by Mrs. Louis E. Will, which memorializes her late husband. Upon the death of Pharmacist Will, the Milwaukee County Pharmacists' Association raised the fund by voluntary contributions as a tribute to his service to pharmacy in the Milwaukee area. Mrs. Will subsequently placed the fund at the disposal of the local A. PH. A. branch, prompted by the "election and coming inauguration of Sylvester H. Dretzka as president of the A. PH. A. at its convention in Milwaukee, and the recent formation of a local branch of the A. PH. A."

A. Ph. A. Branches

PROGRAM committees should get some real help from the new plan to provide A. PH. A. branches with lists of available speakers. Your branch secretary has received the first roster of speakers, and a few additional names are now available on request. A. PH. A. Secretary Fischelis indicates that further information will be bulletined to your branch from time to time. If the speaker's travel expense is a problem, check with another branch or other pharmaceutical organization in your area to see if two addresses can be scheduled for the same trip and the expense shared.

A vote of thanks goes to President Earl R. Serles who initiated the plan for a speakers' bureau.

Every active branch owes a great deal to its program committee. The success of branch activities will often depend on the inspiration and perspiration that this group generates.

Other committees of course have an equal responsibility in their own field. Committee work always imposes something of a burden, but it is what makes the wheels go 'round. This is always evident from branch reports that come into A. PH. A. headquarters. There seems to be a wide variation in the purposefulness and activity of committees in different branches. It might be well for each branch to review its committee structure.

LOCAL BRANCHES

Meetings of the **Michigan Branch** are so well attended that arrangements have been made for larger quarters, according to Secretary Ben Bialk. Members of the Branch give a great deal of credit for this situation to the planning by Program Committee Chairman E. R. Jones. Two speakers on subjects of general interest are usually booked for each meeting. At a recent session, "Products from the Fractionation of Human Blood" was discussed by Dr. Glenn C. Bond, assistant department head in bacteriological research for the Upjohn Co. Dr. E. Fullerton Cook, chairman of the U. S. P. Revision Committee, delved into the history of the U. S. Pharmacopœia and reviewed the 13th revision, which has just become available. The double feature at the February meeting included Dr. Frederick F. Yonkman, research director for Ciba Pharmaceutical Products, who spoke on "Some Recent Advances in Medicine," and W. Ray Richardson of Parke, Davis & Co. who discussed "Conditions in Australia During the War."

Possibilities of translating National Formulary VIII into Spanish received the attention of the **Puerto Rico Branch** recently, and the secretary was instructed to contact A. PH. A. headquarters regarding this proposed project of the ASSOCIATION. Several months ago, Adolfo L. M. Anselmi, president of the Puerto Rico College of Pharmacists, addressed the Branch on "Duties of the Pharmacist to the Community." Puerto Rican branch members have been exploring the possibility of establishing a scholarship at the University of Puerto Rico.

Dr. Hans Lindholm from Denmark—who is conducting a study of pharmacy in the United States under the auspices of the Danish Pharmaceutical Association—lectured on "The Practice of Pharmacy in Denmark" at a recent session of the **Northern California Branch.**

Guidance of the **Western New York Branch** for the next year has been placed in the hands of the following officers: Dr. Joseph B. Sprowls, president, Gertrude H. Mroczynski, first vice-president, Robert A. Fitch, second vice-president, S. Walley Bower, secretary, and Francis P. Taylor, treasurer. The new president discussed "Pharmacy of the Future" at the March meeting.

The **Pittsburgh Branch** has announced plans for a full day's conference on May 5. Among other features, the Branch expects to review N. F. VIII, hold a prescription clinic, and present a film on trends in pharmacy and medicine. The Branch has established a Radio Committee to develop programs and to monitor broadcasts and report on favorable or unfavorable references to the profession.

Secretary McNeil reports that Dr. Philip Levine, director of the Biological Division, Ortho Research Foundation, discussed "The Rh Factor in Clinical Medicine" as guest speaker of the **Philadelphia Branch** in February. Dr. Levine has received honors from such organizations as the American Society of Clinical Pathologists for his outstanding contributions to scientific knowledge on the subject.

Eight steps required to develop and produce a pharmaceutical product were outlined by Dr. Robert D. Coghill, director of research at Abbott Laboratories, in his talk on "The Coordination of Pharmaceutical Research" before the **Chicago Branch** in January. The Branch members paid tribute to A. H. Clark, the late acting dean emeritus of the University of Illinois College of Pharmacy, for his contributions to pharmacy, education and the A. PH. A.

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A. PH. A. KILMER PRIZE ENTRIES MUST BE SUBMITTED BY JUNE 15

Entries in the competition for the Kilmer Prize of the AMERICAN PHARMACEUTICAL ASSOCIATION must be submitted to the secretary of the ASSOCIATION by June 15, Dr. L David Hiner, chairman of the Kilmer Prize Committee, has announced. The award is made for meritorious work in pharmacognosy through a bequest by the late Dr. Frederick B. Kilmer. Papers entered in the competition must represent the work of members of the 1947 senior class of a pharmacy college. Other rules of the competition are available from college deans.

The Kilmer prize Committee, which functions through the Scientific Section of the A. PH. A., selects a recipient for the award annually if a sufficiently meritorious paper is submitted.

E. F. KELLY PORTRAIT GIVEN TO N. C. SCHOOL

An oil portrait memorializing the late Dr. E. F. Kelly, secretary of the AMERICAN PHARMACEUTICAL ASSOCIATION from 1926 until his death in 1944, has been presented to the University of North Carolina School of Pharmacy by North Carolina pharmacists. Dr. Kelly was a native of Carthage, N. C.

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New A. Ph. A. Members

The American Pharmaceutical Association extends a cordial welcome to the men and women joining in its expanded program on behalf of the profession. Those accepted for active membership during the month preceding January 20 are listed below.

NEW LIFE MEMBERS

Burt, Joseph Bell, Lincoln, Nebr.
Ewing, Clare O., St. Louis, Mo.
Goodrich, Forest, Seattle, Wash.
Gregg, Henry, Minneapolis, Minn.
Guy, George H., Seattle, Wash.
Jenkins, Glenn Llewellyn, Lafayette, Ind.
Johnson, Theodore, Havana, Cuba
Lanwermeyer, Charles F., Waukegan, Ill.
Lynn, Eldin Verne, Boston, Mass.
Serles, Earl R., Chicago, Ill.
Seybert, John Edward, Indianapolis, Ind.
Sherman, Louis C., Wood, Wis.
Tibbetts, Theodore R., Augusta, Me.
Wolfson, Sidney B., Chelsea, Mass.

ARIZONA

Thompson, W. A., Globe

CONNECTICUT

Mogull, Edward, Bridgeport

GEORGIA

Vickers, William R., Jesup

ILLINOIS

Hughes, Robert J., Winnetka
Kirsh, Morris, Chicago
Kitsuse, Nelson Y., Chicago
Kupsch, Arno W., Chicago
Spranza, John J., Chicago

INDIANA

Deeg, Emil E., Evansville
Elliot, V. Kiefer, Sheridan
Krueger, Fred W., Fort Wayne
Mann, Alvin J., Evansville
Wood, Francis W., Evansville

IOWA

Seberg, Edward W., Marshalltown

MARYLAND

LaRocca, Joseph P., Baltimore
Moscati, Marius, Baltimore
Smith, Pierre, F., Baltimore

MASSACHUSETTS

Brault, Raymond L., Worcester

MICHIGAN

Anderson, Eleanor, Detroit
Barson, Margaret, Dearborn
Barton, Paul E., Detroit
Benz, R. W., Ann Arbor
Hamann, Charles Henry, Detroit
Harrison, Lyle D., Detroit
Nehlsen, E. A., Ypsilanti
Parker, E. C., Ypsilanti
Skuban, George L., Ann Arbor
Steadman, Walter, T., Detroit
Stenzel, J. W., Ann Arbor
Sweitzer, John E., Birmingham
Thistlethwaite, Fred H., Detroit
Warner, Richard S., Ypsilanti
Yargates, Michael, Ann Arbor

MISSOURI

Kunz, Irving B., St. Louis
Traxler, Seymour D., Kansas City

NEW JERSEY

Bafus, George L., Orange
Dyckmans, John J., Dover
Genovese, Cosmos D., Newark
Neilson, Paul E., Hillsdale
Rosenstein, Morris, Plainfield
Schwartz, William, Jersey City
Utzinger, Albert V., Plainfield
Wilhelm, Rudolph L., Jersey City

NEW YORK

Buckwalter, Frank H., Dewitt
Golden, Sidney, New York
Schneider, Herbert H., Queens Village
Shapiro, Max, Brooklyn
Verdejo, Guillermo, New York
Weiner, Leo, Brooklyn
Yoss, Eugene J., New York

OHIO

Chambers, Melvin A., Columbus
Rolnick, Abraham, Cleveland Heights
Schroeder, Nelson R., Cleveland

OREGON

Smith, Simeon C., Albany

PENNSYLVANIA

Lebowitz, Aaron L., McKeesport

TENNESSEE

Foster, Shirley L., Memphis

TEXAS

Winniford, Charles E., Dallas

VIRGINIA

Brumer, Sidney, Richmond
Mayhew, Marion Frances, Fincastle

WASHINGTON

Seigley, Frances M., Seattle

WISCONSIN

Averbook, A. B., Superior
Berg, J. B., Mondovi
Best, Louis J., Randon Lake
Cormac, William F., Phillips
Fischer, Fred W., Milwaukee
Goggin, Ronald J., Adams
Griffith, Kenneth H., Racine
Look, Fred, Madison
Loppnow, William F., Milwaukee
Mackowski, Miecislas T., Milwaukee
Raeuber, E. G., Milwaukee
Scobie, Frank G., Wauwatosa
Wein, Alvin, West Allis

FOREIGN

Ferrari, Germaine M., Tecumseh, Ontario, Canada
Kawwaf, Hasan M., Latakia, Republic of Syria
Ruben, Haushalter G., Haifa, Palestine
Waylonis, Paul A., Cristobal, Canal Zone

Those accepted for active membership during the month preceding February 20:

ALABAMA

Payne, Roy W., Jasper

ARIZONA

Cameron, R. Becton, Phoenix
Wilson, Ray Lee, Phoenix

ARKANSAS

Harrington, Clifton W., Jr., Marianna

CALIFORNIA

Airston, Margaret, Los Angeles
Burns, Vesta S., Los Angeles
Chariton, Harry, Tarzana
Clark, William W., Berkeley
Cooley, Russell A., Pasadena
Divine, P. G., San Francisco
Hubbard, Everett J., Burlingame
Hulett, Arthur G., Los Angeles
Lester, Warren A., Alameda
Male, Francis E., San Francisco
Post, Russell Adelbert, Los Angeles
Sah, [illegible]er Pen-Tieh, San Fr[illegible]sco
Schwartz, Simon Michale, Los Angeles
Sutton, Sydney C., San Mateo
Tsujimoto, Masao, Oakland
Vasey, Thomas William, San Francisco
Yalon, Jerome M., San Francisco

CONNECTICUT

Austin, Raymond Alton, Milford
Klein, Harold J., Bridgeport
Smeriglio, Michael J., Cos Cob

DISTRICT OF COLUMBIA

Hertzlich, Abraham, Washington
Rippey, Stephens, Washington
Taft, Harry C., Washington

NEW LIFE MEMBERS

Castellanos, Baudilio, St. Louis, Mo.
Fischer, Louis, Seattle, Wash.
Francke, Don E., Ann Arbor, Mich.
Gershon, Solomon D., Chicago, Ill.
Hein, Henry F., San Antonio, Texas
Hood, Frank, Jr., Indianapolis, Ind.
Niemeyer, Gloria, Washington, D. C.
Parker, Emery W., Victoria, Texas
Zienty, Ferdinand B., St. Louis, Mo.

GEORGIA

Barfield, William Harward, Columbus

ILLINOIS

Axelrod, David, Chicago
Berger, Melvin Lewis, Chicago
Boffa, Philip J., Chicago
Budny, Jerome V., Chicago
Campbell, John C., Chicago
Currier, Harvey P., Danville
Drury, Elnorah, Alton
Granberg, Charles B., Chicago
Hanson, Otto A., Forest Park
Harris, William W., Chicago
Jacobs, Clyde E., Lake Bluff
Little, William Charles, Oak Park
McCallum, Archie H., Chicago
Mrazek, Rudolph G., Chicago
Mulligan, Robert Emmet, East St. Louis
Pratt, Ralph F., Milford
Sebald, Charles Wm., Danville
Smith, Wilbur R., Peoria
Wankovsky, Meyer, Chicago
Zaleski, Rufin H., Chicago

IOWA

Fujiki, Miss Nobuko, Des Moines
Rise, Herbert E., Des Moines

KANSAS

Burke, James E., Baxter Springs

KENTUCKY

Forbes, Walter R., Louisville

LOUISIANA

Alford, Guy H., Columbia
D'Antonio, Anthony G., New Orleans
LaBranche, Emile J., Jr., New Orleans
Sampagnaro, Joseph C. Monroe

MARYLAND

Gibbs, Jocelyn L., Baltimore
Schwartz, Alvin, Glen Burnie
Waterman, Richard H., Baltimore

MASSACHUSETTS

Assaff, Helen, West Roxbury
Cohen, Henry L., Roxbury
Goldstein, Harold, Springfield
Greene, Arnold A., Allston
Hughes, Thomas F., Holyoke
Puopolo, George, Boston
Russell, George Sydney, Amherst
Stepanian, Stephen, Boston
Vander Wyk, Raymond W., Waltham

MICHIGAN

Coe, Howard, Birmingham
De Young, Tharon M., E. Lansing
Fox, Orrin P., Dearborn
Heckle, Ferd. E., Detroit
Holdreith, Clarence A., Detroit
Leacock, Walter G., Dearborn Township
Petrock, Joseph Arthur, Detroit
Aisawa, Saburo, Minneapolis
Anderson, Allan A., St. Paul
Bacon, Victor G., Excelsior
Shima, Stanley J., Chaska
Strunk, Joseph B., Shakopee
Kleven, Azor J. N., St. Paul

MISSISSIPPI

Ready, J. D., Jackson
Sister Mary Carl Marty, O.P., Jackson

MISSOURI

Chang, Chi-chung, St. Louis
Chang, I-tung, St. Louis
Chang, Tsu-tung, St. Louis
Kung, Chuan-chung, St. Louis
Kunze, Willard T , Farmington
Lalonde, Edgar Joseph Everett, St. Louis
Matsumoto, Grace Toshiko, St. Louis
Ritter, A. M., St. Louis
Shaw, Mrs. Lynwood E., St. Louis
Shu, Chung-Wu St. Louis
Wagner, E. L., University City

NEBRASKA

Armstrong, L. LeRoy, Scottsbluff
Voss, Elbert, Omaha

NEW HAMPSHIRE

Lord, Clifton F., Jr., Concord

NEW JERSEY

Capone, Ermete Ralph Newark
DeCosta, Leo J., New Brunswick
Friedland, Frances, Lincoln Park
Haines, J. Harry, Interlaken
Horowitz, Harold, Elizabeth
Lewit, Walter J., Newark
Mintz, Joseph E., Camden
Ohland, William Justin, Nutley
Smith, William P., Cranford
Struckmann, Albert R., Bogota
Suessmuth, Babette S., Nutley
Tarrant, Nicholas F., Ridgewood
Teimer, Theodor, Jr., Verona
Zausmer, Irving I., Asbury Park

NEW MEXICO

Brister, Allen, Albuquerque
Geyer, Fred J., Albuquerque
Hill, Donald M., Fort Bayard
Hofmann, Seth K., Albuquerque

NEW YORK

Abramson, Bernard, White Plains
Annis, George W., Forest Hills
Earl, John B., Cairo
Ellegast, Joseph J., Bronx
Feldman, David, New York
Fleenor, Lloyd French, Sr., Ozone Park
Luongo, Hugh J., Flushing
Mattikow, Morris, New York
Moosnick, Bernard S., New York
Slavin, Morton, Brooklyn
Smith, Nathan, New York
Sorkin, Alfred, Bronx
Sorkin, William, Bronx
Stern, Seymour, Brooklyn
Stevens, Eli, Brooklyn
Tucker, Louis, Bronx

NORTH CAROLINA

Dudley, William G., Jr., Reidsville
Estes, Joseph C. Jr., Raleigh
Johnston, Anthony, Littleton
White, Elliott Sylvester, Burlington

OHIO

Alperin, Harry L., Cleveland
Barnes, William J., Middlefield
Beamont, Gerald S., Columbus
ell, Kenneth C., Cuyahoga Falls
Blakeway, Ralph William, Cleveland
Broadhurst, George T., Lakewood
Brody, Morris, Cleveland Heights
Buzzelli, Victor A., Shaker Heights
Carson, J. P., Applecreek
Cassaday, Nancy Jane, Youngstown
De Haan, Gerald L., Maumee
DiMarco, Joseph E., Cleveland
Eisen, Morris, Cleveland
Falzine, Esther, Cleveland
Feuer, Louis L., Cleveland
Gechter, Frank W., Rocky River
Graf, Leo C., University Heights
Grega, Charles A., Cleveland
Griger, Albert Bill, Cleveland
Harris, L. L., Brewster
Hartford, Peter C., Cleveland
Hudson, Edward J., Euclid
Israel, David, Cleveland
Klein, Joseph D., Cleveland
Kochtan, Joseph F., Cleveland
Kral, Ernest J., Cleveland
Lindenmuth, Russell E., Dayton
Mannino, Frank N., Lakewood
Marks, Seymour, E. Cleveland
Matousek, C. Anthony, Cleveland
McAllister, Wallis K., Cleveland
McCrea, Kenneth W., Cleveland
McKee, Ruth M., E. Cleveland
McKissick, Cullen Bradford, Cleveland
Mobily, Salvatore E., Cleveland
Muskoff, Daniel H., Wooster
Prijatel, Stanly M., Cleveland
Reeb, William F., Cleveland
Robbins, Samuel M., Cleveland
Roseman, Charles E., Jr., Cleveland
Rudolph, Harry, Cleveland
Schaefer, Paul J., Cleveland
Senff, Donald, Wooster
Shane, Carl J., Canton
Sister M. Fedelmia C.S.A., Cleveland
Sister M. Mariel German, Lakewood
Solon, Howard J., Wooster
Stepfield, E. W., Doylestown
Tischbein, Harry J., Cincinnati
Tucker, Jacob, Cleveland Heights
Weinberger, Adolph, Cleveland
Wilson, Fred, Berea
Wyatt, Donald L., Cleveland Heights
Zipp, Jack D., Cleveland
Zubricky, Rose Marie, Bay Village

OREGON

Boucher, Hazen A., Portland
Wellman, Lyle Howard, Portland
Wilkes, Francis L., Salem

PENNSYLVANIA

Barch, George F., Tarentum
Burns, John M., Morrisville
Cox, Malcolm W., Philadelphia
Fellows, Edwin J., Philadelphia
Hasiuk, Solomon Joseph, Philadelphia
Intrieri, Mary Concetta, Baden
Kercher, Edwin H., Philadelphia
Kime, Robert B., Philadelphia
Kist, E. Ray, Derry
Lerner, Albert, Philadelphia
Meuhlmann, Frank, Philadelphia
Murphy, George V., North Braddock
Sister Barbara Marie Reusing, Glen Riddle
Sister Virginia Marie Waudby, Greensburg
Solonen, Nicholas William, Easton
Sterner, Joseph R., Perkasie
Thomassy, Arthur L., Pittsburgh
Verbofsky, H., Pittsburgh

RHODE ISLAND

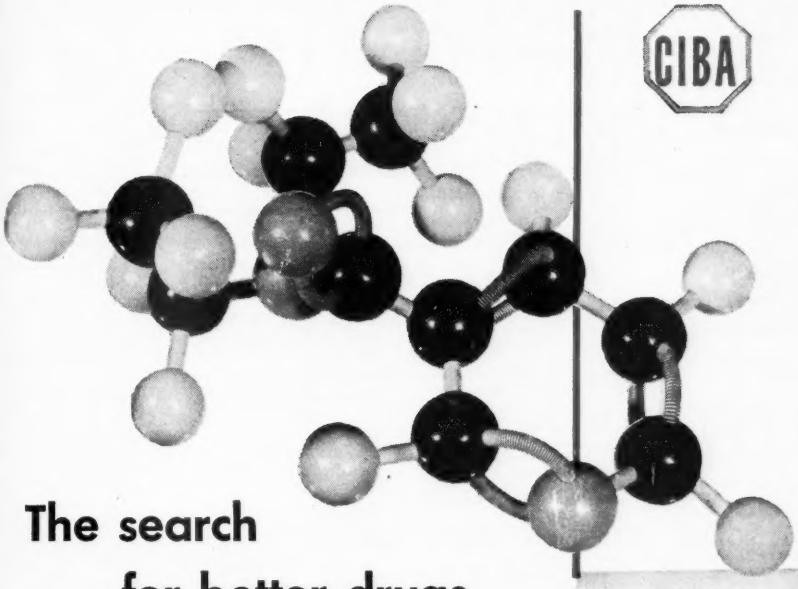
Daigle, Robert J., Wallum Lake
Mignacca, Basil J., Providence

TENNESSEE

Gable, Orin R., Nashville
Hoffman, Phillip H., Chattanooga
Mayton, Wallace Howard, Jr., Memphis

TEXAS

Daggett, C. P., Houston
Millar, Charles D., Grand Prairie
Smith, Ernest G., Jr., Houston
Watson, Harold V., Hull



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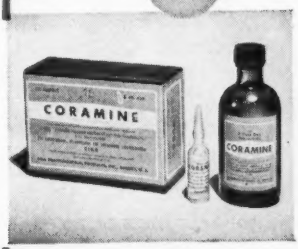

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Gaunt, Hunter, Winchester
Goriup, Othmar Frank, Alexandria
Jackson, Eugene L., Richmond
Levine, Sol, Portsmouth
Wills, Clyde Lewis, Newport News

WASHINGTON

Bracken, Jim L., Seattle
Cunningham, Vernette Engebretson, Seattle
Lotz, Mrs., Nellie Louise, American Lake
Monteith, Melvin E., Seattle

WEST VIRGINIA

Gladwell, Richard M., Huntington
Guerrieri, Emidio, Morgantown
Koether, Gladys E., Martinsburg

WISCONSIN

Betts, Merle P., Milwaukee
Bruss, Bernard W., Milwaukee
Chesebro, Glenn A., Madison
Freese, Dorrance F., Superior
Hansen, Ray, Milwaukee
Kromraj, Henry S., Madison
Krygier, Andrew A., Milwaukee
Krygier, Mary Ann, Milwaukee
Lippold, William, Milwaukee
McVey, Virginia F., Milwaukee
Olson, Arnold L., West Allis
Pritzlaff, Chester, Milwaukee
Raiche, Edward H., Milwaukee
Rozewski, Anthony, Milwaukee
Simons, Jasper E., Milwaukee
Volkmann, Elmer O., Milwaukee
Warner, James S., Milwaukee
Werba, Charles, Milwaukee
Willis, Oscar, Milwaukee

FOREIGN

Batycky, Yaroslaw B., Winnipeg, Mantioba, Canada
Beesley, Marion Elaine, Regina, Saskatchewan, Canada
Colleck, M. Barney, Scarboro Bluffs, Ontario, Canada
de Camacho, Josefa B., Farmacia, Central Cayey, Puerto Rico
Gagnon, Francois, Quebec, Ontario, Canada
Huston, Mervyn James, Edmonton, Alberta, Canada
Noord Hoek-Hegt, Rudolf Johan, Curacao, Dutch West Indies
Pietri, Aida M., Ponce, Puerto Rico
Tajirian, Ardax Vahan, Kirkuk, Iraq
van Os, D., Groningen, Netherlands
Vospalek, Bojan, Prague, Czechoslovakia

Deceased Members

Andersen, J. C., Seattle, Wash., Died May 30, 1946
Blanvelt, Wm. H., Asheville, N. C., Died Feb. 20, 1946
Christensen, H. C., (a life member), Chicago, Ill., Died Jan. 19, 1947
Clark, Albert H. (a life member), Chicago, Ill.
Clark, Leo C., Pawtucket, R. I.
Davis, Percy M., Scranton, Pa., Died Dec. 28, 1946
Dewis, Wm. J., Paterson, N. J., Died Sep 6, 1946
Finch, S. M., Altaden Calif., Died Augus 1946
Gray, William (a li member), Chicag Ill., Died Sept. 1 1946
Hancock, Frankl Wills, Oxford, N. C Died Jan., 1947
Kunz, Harman A., S Louis, Mo., Died De 8, 1946
Massengill, S. E., Bri tol, Tenn., Died De 15, 1946
Porter, Stanley P., Pitt burgh, Pa.
Reich, Leo, New Yor N. Y., Died March 1946
Taliaferro, G. E., She field, Ala., Die March, 1946
Urffer, Samuel, Phil delphia, Pa.
Velsor, Joseph Henr New York, N. Y Died Feb. 28, 1946
Ward, William K. D troit, Mich., Die May, 9, 1946

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